Marine Review

The National Publication Covering the Business of Transportation by Water

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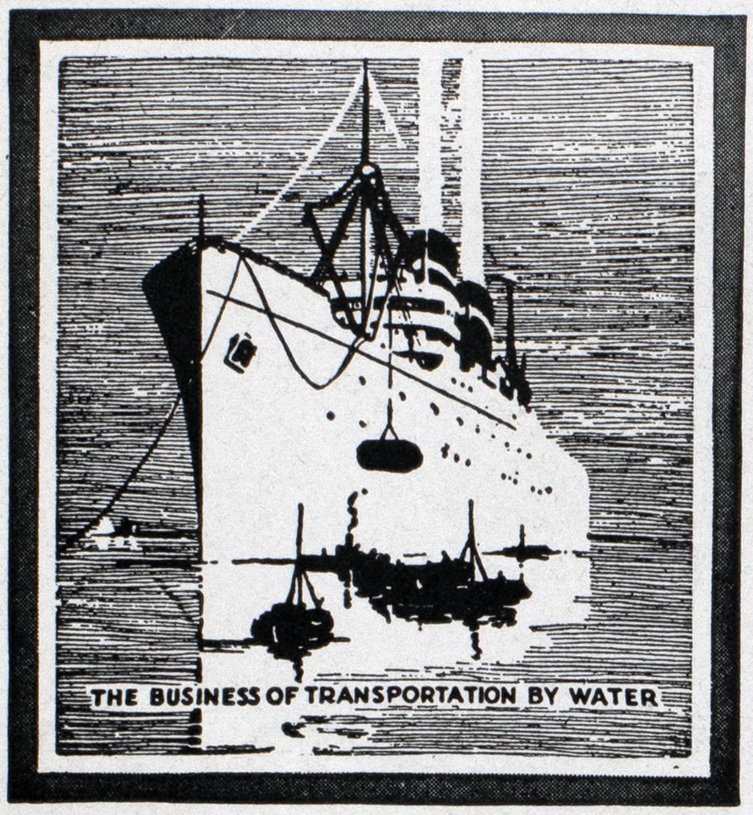

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CONTENTS

Vol. 60 **May 1930** *No. 5*

	Page
The Shipping Board and the Merchant Marine..... Editorial	19
Mail Contracts Recently Awarded to Operators.....	21
Santa Clara—Photographs of Interior Spaces.....	22-23
Borinquen—New Porto Rico Liner Building.....	24
Third National Marine Conference Convenes.....	25
European Shipping Now at Low Point..... By Frank C. Bowen	27
Saranac, Coast Guard Cutter, Is Launched.....	29
Corsair, New Morgan Yacht Launched at Bath.....	30
Lake Carriers Hold Meeting at Cleveland..... By A. H. Jansson	31
Launch Two Baltimore & Ohio Harbor Tugs.....	33
Circulation Aided in Scotch Boilers..... By C. A. Seley	34
Prince Henry, Canadian Passenger Vessel Launched....	36
Portland to Celebrate Second Annual Marine Day.....	38
Interior Views on German Liner Europa.....	39
Maritime Law—Late Decisions..... By Harry Bowne Skillman	40
Fireboat for City of New York Is Rebuilt.....	41
Patents Show Marine Development..... By Richards & Geier	43
Modern Ore Terminal Building at Toledo..... By W. G. Hildebran	44
Men of Marine Affairs—Photographs.....	45
Stevedoring and Dock Management Progress.....	46
Chicago Preparing for Shipments to Atlantic By W. W. Huggett	
Where Mechanical Handling Cuts Costs By H. E. Stocker	
Night Club on United States Liner Leviathan.....	50
Ports—Marine Business Statistics Condensed.....	51
Equipment Used Afloat, Ashore.....	52
Railway Dry Dock Built For Lake Champlain.....	55
Personal Sketches of Marine Men.....	56
Henry F. Schmidt, Consulting Engineer By A. H. Jansson	
World Shipbuilding at New High Level.....	58
Up and Down the Great Lakes.....	64

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Marine Review
May 1930

America's Greatest Ship in America's Greatest Dry Dock—Leviathan at Boston

What the Shipping Board Is Doing to Build Up Merchant Marine

Editorial

NO GOVERNMENT agency can be expected to function with the efficiency of a properly conducted private business. Initiative and action are bound to be slowed up by government red tape. Any man coming into power, for instance, in the conduct of a great publicly owned merchant fleet thinking that he can upset all of these well established customs of inefficiency would soon end up disillusioned and sorely disappointed. We are certainly in favor of the best possible management of such a business in the public interest. Certainly no one could condone anything but the strictest probity in every dealing. But aside from these fundamentals of honesty and efficiency the man who is to control a great government's marine affairs needs to be of the practical persevering kind who is not greatly troubled by the ever-present attempt at political manipulation.

We feel that T. V. O'Connor, the present chairman of the United States shipping board, who has held this office for six years, has done a remarkable job when everything is weighed. Firmness and diplomacy have made it possible for him to make discordant elements pull together for the ultimate good of the country's merchant marine.

He had the courage to recommend scrapping of ships. This was a policy advocated by MARINE REVIEW as early as September, 1921 and again in April, 1923. But it took courage at that time to attempt to carry out such a policy. At the dinner of the Lake Carriers recently in Cleveland, this veteran Great Lakes longshore labor leader was warmly applauded for his good management of a difficult problem. He told an interesting episode of his early sales proposals for scrapping. It had been stipulated in the contract that no part of the ships sold could be re-sold for use in its original capacity. Criticism was made of this stand, and finally President Harding called him in and wanted to know what his idea was in forcing the scrapping of perfectly good machinery. When he informed the President that this was done to protect American builders of boilers, pumps, steering engines, deck winches and all other machinery and equipment used in a ship, the President told him to go ahead with his

program. There is no question but that exactly this policy of scrapping for scrap alone has been the correct way to do away with these useless ships and to keep them, whole or in part, from glutting an already greatly overburdened industry.

It is significant to note that there are now only 250 government owned merchant vessels in the reserve fleets, in lay-up. These vessels are divided as follows: Thirty-four in such condition that they could go to sea with but little delay; in the first reserve, 100; in the second reserve, 74 and in surplus, 42. Most of these vessels will sooner or later be disposed of either for scrap or with stipulations in regard to operation so that they will have the least possible influence in retarding the construction of modern and more suitable ships.

There are 211 government owned ships distributed among 18 shipping board lines operated by private companies and 21 under charter to American operators. It is well known that for several years the board has carried out, under the initiative of the chairman, a policy of selling established lines to competent private operators. This policy should be pursued as effectively and as rapidly as possible with the remaining established lines to the end that the government may be rid of the ownership of all ships and that a privately owned merchant marine may be strengthened, and placed on a permanent and successful basis.

Careless criticism, though the motive of such criticism may be sincere, can do much harm. It is astonishing that any congressman with such a notable career of public service as Representative LaGuardia of New York should make so unwarranted an attack on the shipping board as he did recently with reference to the attempt the board is making to reduce the cost of operating the lines which it still owns. These lines and all of the numerous lines which have already been sold had been operated for many years on a form of managing owner-ship contract. It is in an attempt to improve on this contract that the shipping board has proposed instead a lump sum arrangement. Under the old agreement the private operator managing a line of ships for the board received a certain compensation regardless of how large the losses may have been. On the lump sum basis the operator will get so much and the necessary repairs, upkeep and cost of operation in other respects must come out of this sum. There will therefore be a direct incentive on the part of the operator to manage the line in the most prudent and most economical manner possible.

In every instance the board has had, one might say, years of experience on these specific routes on which to base an equitable amount for a so-called lump sum contract. The whole thing is as clear as possible. The board is merely trying to improve its methods of operation and to reduce the outlay from the public treasury.

In view of all this it is ridiculous for any congressman to represent, as "legalized banditry," this business move on the part of the shipping board, to change its contract terms with private operators of government owned vessels in the interests of greater economy.

Marine Technical Standards

SO MUCH has been done in the elimination of waste by means of standardization and co-ordinating separate activities, that any other reasonable proposal to still further this objective in marine affairs should be viewed with sympathy and supported as far as possible. Such a proposal is now being made for setting up the necessary machinery in an attempt to obtain international marine technical co-ordination. The tentative plans call for organizing in London a preliminary committee of naval architects and engineers representing Great Britain, United States, France, Germany, Italy, Japan and any other maritime country which may desire to join, for technical co-ordination. The main objective of this committee would be the preliminary assembly of suggestions on various technical subjects and to arrange the form for a vote to be taken among professional and active members of the leading technical institutions all over the world.

It is perfectly clear from past experience that no one national technical society or institution, no matter of what standing or how powerful, could carry out universal technical co-ordination. It would be met by an attitude of nationalism which would destroy the effort at the start. An example is recalled at the time of the international congress of naval architecture at the Paris exhibition thirty years ago. It was then proposed to standardize the fundamental design of the screw propeller. The institutions interested in the subject were to carry out this objective, but it was never put into practical shape and it was abandoned because of neglect. More along this same line is contained in a prospectus prepared by John DeMeo, member of the Society of Naval Architects and Marine Engineers.

Nationalism is bound to play an important part in the customs and habits of people. This extends without doubt to technical matters. This freedom of choice must be continued in any essential matter, but it is true that much could be done to advance the practical development and progress of naval architecture and marine engineering by co-operating in developing the best technical standards.

Amending the Seaman's Law

ANYTHING which is of direct or indirect benefit to the men who operate the ships of the Great Lakes would be welcomed by vessel owners. It would be short sighted for the Lake Carriers' association or any other body to oppose any proposed amendment to a law in congress which would be for the good of the men upon whom they must depend to operate their ships. In other words the opposition offered by the leading vessel interests of the Great Lakes to the amendment to the seamen's act proposed by Senator LaFollette of Wisconsin may be taken at its face value and to mean that the provisions of this amendment will not in any way benefit the sailors of the Great Lakes. Furthermore the provisions of this amendment have been drawn having in mind conditions on salt water and particularly trading foreign. Neither the Great Lakes nor coastwise shipping should come under the terms of this amendment in several particulars.

It is not necessary to protect the interests of the men in these trades by having them sign on before a commissioner as is now done in foreign trade. It would just be a cumbersome and bothersome regulation. The stay in port is remarkably short. There is comparatively small turnover in crew. Some vessels on the lakes go through a full season without changing a single man and there are instances, not uncommon, where men remain with the same vessel or the same officers year after year.

The provision that no men are to be shipped or discharged unless the vessel is connected with the shore by gangplank may have had some justifications in the days when shanghaiing and crimping were practiced. These things are all passed away and certainly on the Great Lakes and in American coastwise ports there

is no possible excuse for the enactment of such a rule.

Other provisions of the act such as making it unlawful to ship any person ineligible to citizenship and payment of half wages are difficult to comply with and merely add burdens to the duties of the master without any equivalent return either to men or owners.

It is difficult to understand why Robert LaFollette, United States senator from Wisconsin, presumably familiar with conditions on the Great Lakes, and, perhaps the run from Boston to New York, should confuse these trades with deep sea voyages in the regulations proposed. The senator could easily determine for himself the absurdity of such a course by making a trip on a freighter or a passenger vessel on the Great Lakes and between Boston and New York.

Additional Mail Contracts

POSTMASTER GENERAL BROWN, with the full support of President Hoover, continues to carry out in a direct and vigorous manner the terms of the merchant marine act of 1928, with reference to mail contracts. A number of important new contracts for carrying United States mail and keeping open communications between the United States ports and important foreign centers have recently been awarded. In the January issue of MARINE REVIEW all mail contracts up to Dec. 11, 1929, were listed with their respective annual rates of payment and new vessels required in due course. The table given below on this page shows the annual payments and the new vessels which must be built in a number of additional routes for which mail contracts have been awarded since the first of the year.

It is difficult to over-emphasize the importance of such effective action on the part of the post office department as a lasting stimulus in building up a real American merchant marine. Surely the promptness and the minimum of red tape with which the law is being carried out are an indication not only of the President's understanding of the needs of an American merchant marine but also of his recognized efficiency in dealing with business problems.

To carry through the program of new shipbuilding required under the terms of the mail contracts already awarded will mean a period of unprecedented activity for every properly equipped American shipyard. Included in this program are two mammoth ships of the LEVIATHAN class. Plans are being actively prepared and contracts should be awarded before the end of the present year. The design and building of two such ships will mean much to the American merchant marine. It may be that we are entering a period of American interest in maritime affairs comparable to the peak of the clipper ship era. It may be that we are on the way to regain our standing as a maritime nation which we first lost due, to some extent at least, to our slowness and reluctance in changing from wooden to iron ships and from sail to steam.

Our experience in merchant shipbuilding cannot be compared with that of Great Britain and the other leading European maritime nations. This lack of experience, however, is partly compensated for by the advance made in the United States in all branches of engineering and architecture. The problems of design, where it involves the lines and the power necessary, we should be able to solve with the same degree of certainty as abroad. It is in the interior arrangement, fittings and decoration where their greater experience is most evident.

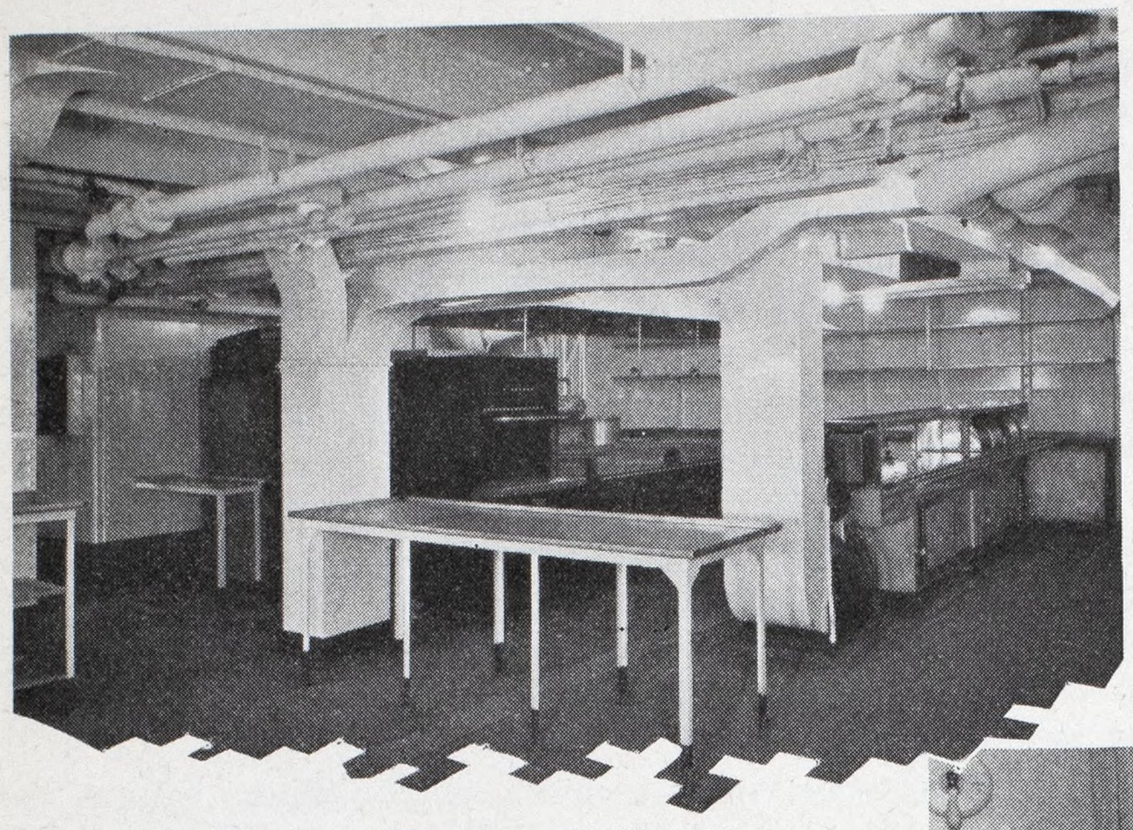
The rehabilitation of the American merchant marine is at hand. Its successful expansion, in years to come, will depend to some extent on how carefully the foundations are now laid. We are bound to assume that the shipping board in conjunction with the post office department and the department of commerce have selected strategic routes, which it is essential to maintain and which will by the very fact of keeping them open increase our trade and travel where it should be increased.

Mail Contracts Recently Allowed

Taken in Conjunction with Table on Page 26 of the January 1930 Issue Marine Review—Represents All Mail Contracts to April 3

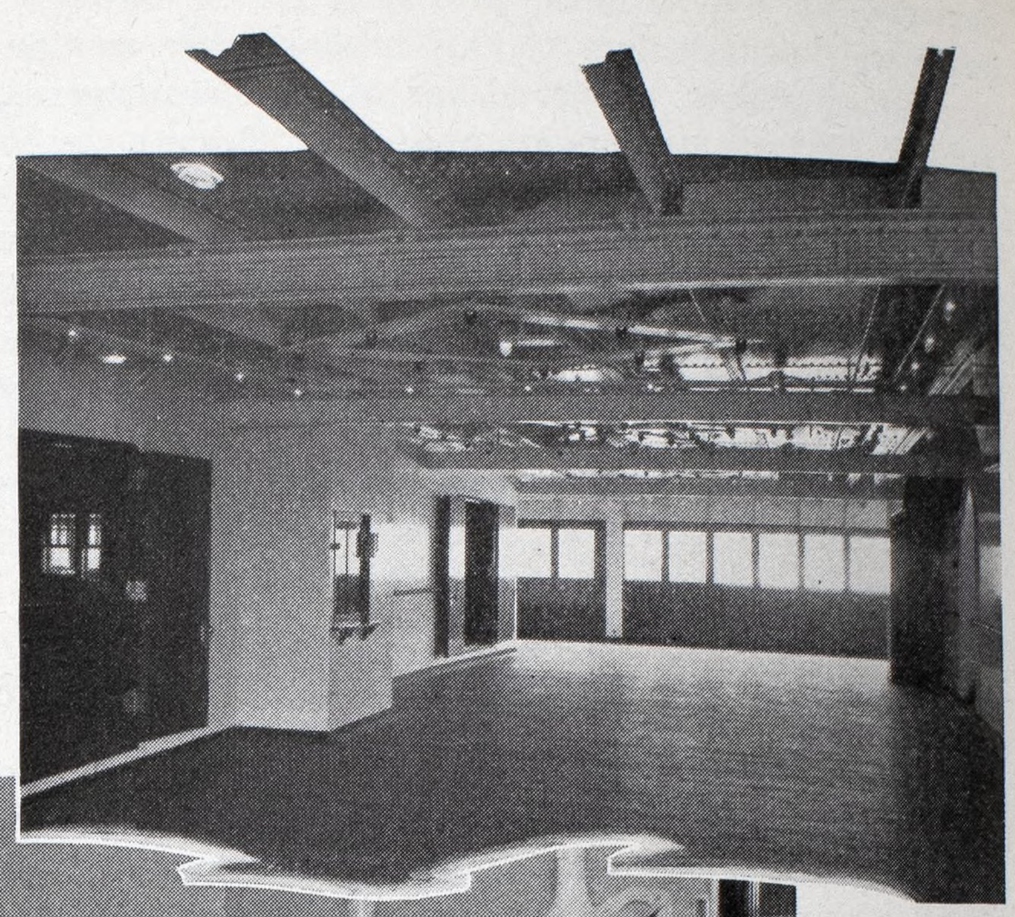
Route Number	Steamship Company and Termini	Class of Vessels Required at Start of Service	Annual Rate of Payment	Class of Vessels Required to be Substituted
19	**Columbian Steamship Company** New York to Puerto Colombia	Class 6—10½ knots—2,550 tons	$277,680.00	3 Class 4—16 knots, two of which at least shall be new. One new vessel not later than end of 3rd year and one new vessel not later than end of 4th year and a 3rd vessel not necessarily new not later than end of 5th year.
37	**Panama Mail Steamship Co.** San Francisco to Puerto Colombia	Class 5—13 knots—4,500 tons	407,576.00	2 new Class 3 vessels within 3 years from beginning of service.
38	**Grace Steamship Company** Tacoma to Valparaiso	Class 6—10 knots—4,000 tons	270,300.00	One new Class 3 vessel within 3 years from beginning of service.
39	**United Fruit Company** San Francisco to Puerto Armuellas	Class 6—11 knots—3,200 tons	392,470.00	3 new vessels of Class 4 within 3 years from beginning of service.
40	**United Fruit Company** New York to Limon	Class 5—13 knots—7,200 tons	247,624.00	3 new vessels of Class 4 not later than 3 years from date of award of contract.
41	**United Fruit Company** New Orleans to Puerto Colombia	Class 6—11 knots—3,200 tons	252,460.00	2 new vessels of Class 4 within 5 years from date of award of contract.
42	**United States Lines** New York to Southampton	Class 1—24 knots—45,000 tons	616,128.00	2 new vessels of Class 1—28 knots not later than 4 years from date of award of contract.
43	**United States Lines** New York to Hamburg	3 Class 3—18 knots 1 Class 4—16 knots 1 Class 5—14 knots	1,312,216.00	2 new vessels of Class 2 not later than 5 years from date of award of contract.
44	**United States Lines** New York to London	Class 5—15 knots—7,000 tons	697,632.00	Term of contract 5 years to be automatically extended for an additional 5 years if contractor agrees to construct 2 new vessels of Class 3 or reconstructed vessels within 3 years after extension.
46	**Roosevelt Steamship Company** Baltimore to Hamburg	Class 4—16 knots—7,000 tons	1,275,144.00	By agreement of contractor and Postmaster General after 5 years Postmaster General may require 2 new vessels of Class 3.

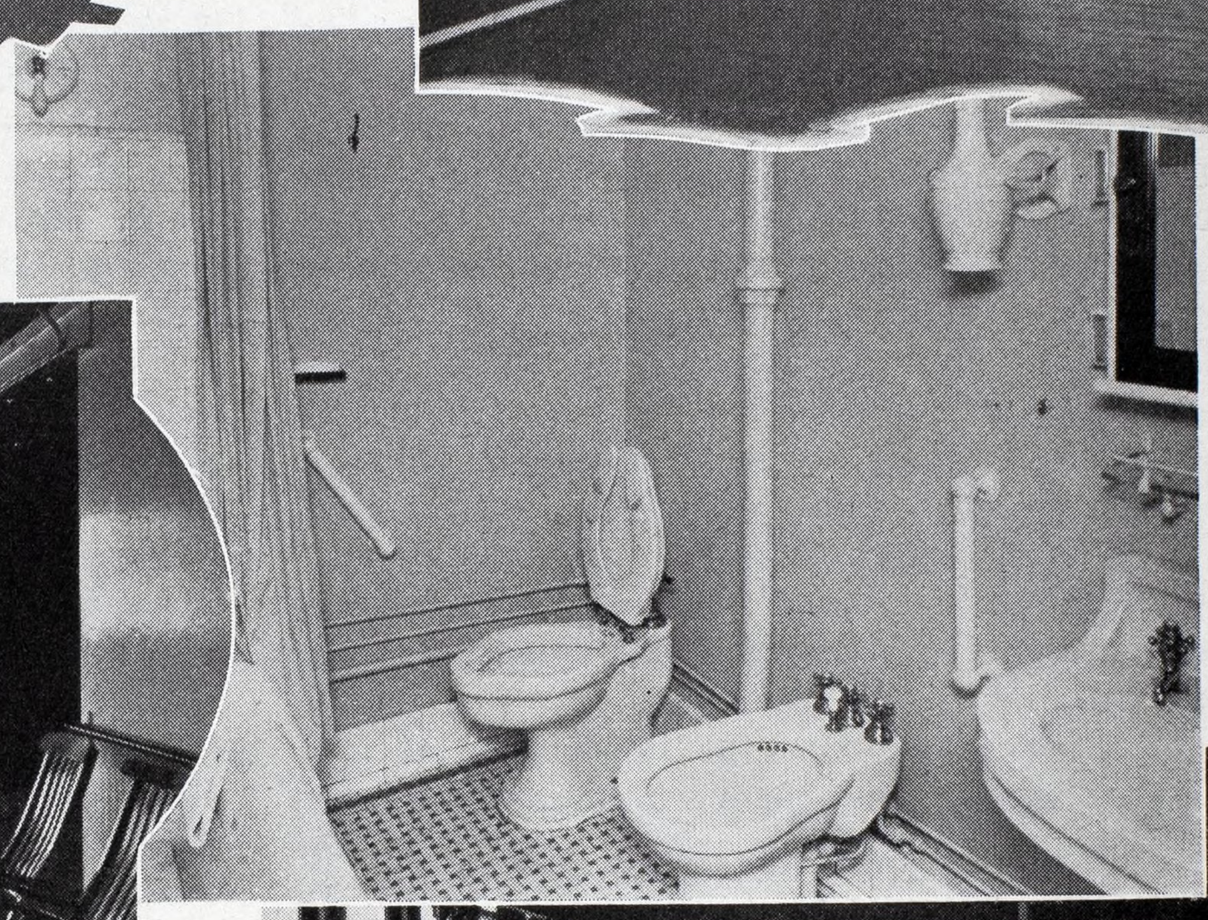
Turbine Electric Liner Santa Clara

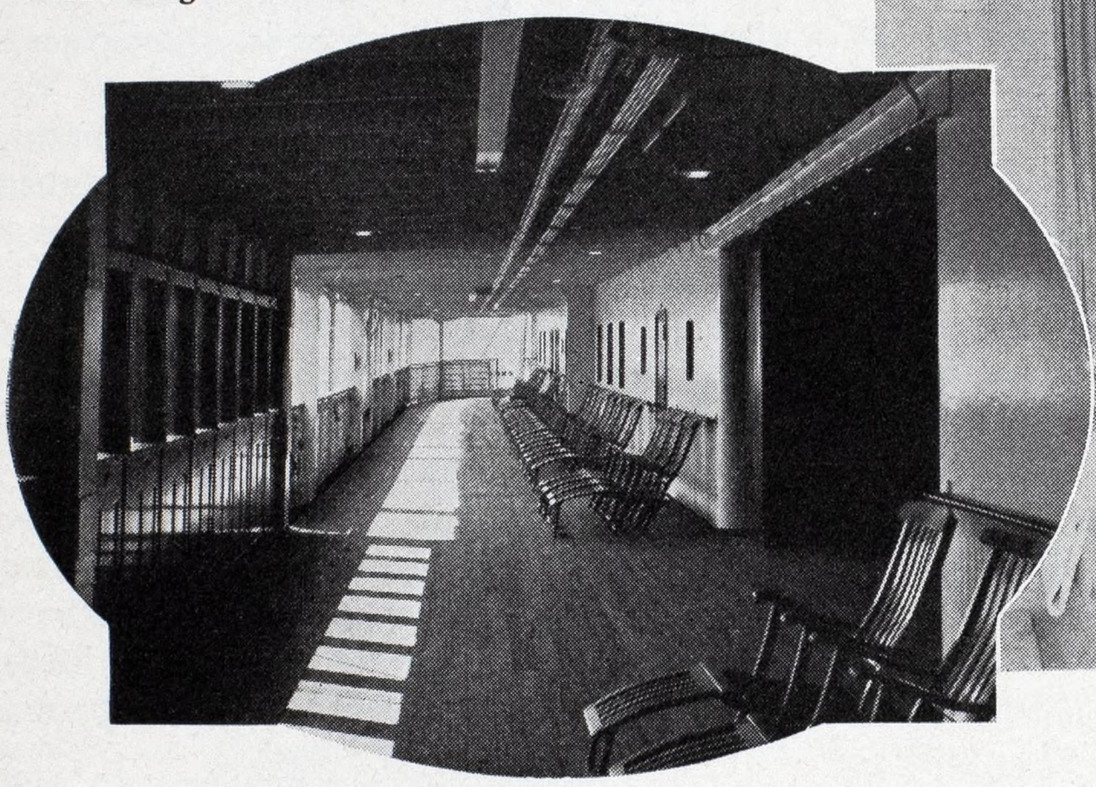


Above—Electric Galley

At Right—Bathroom First Class

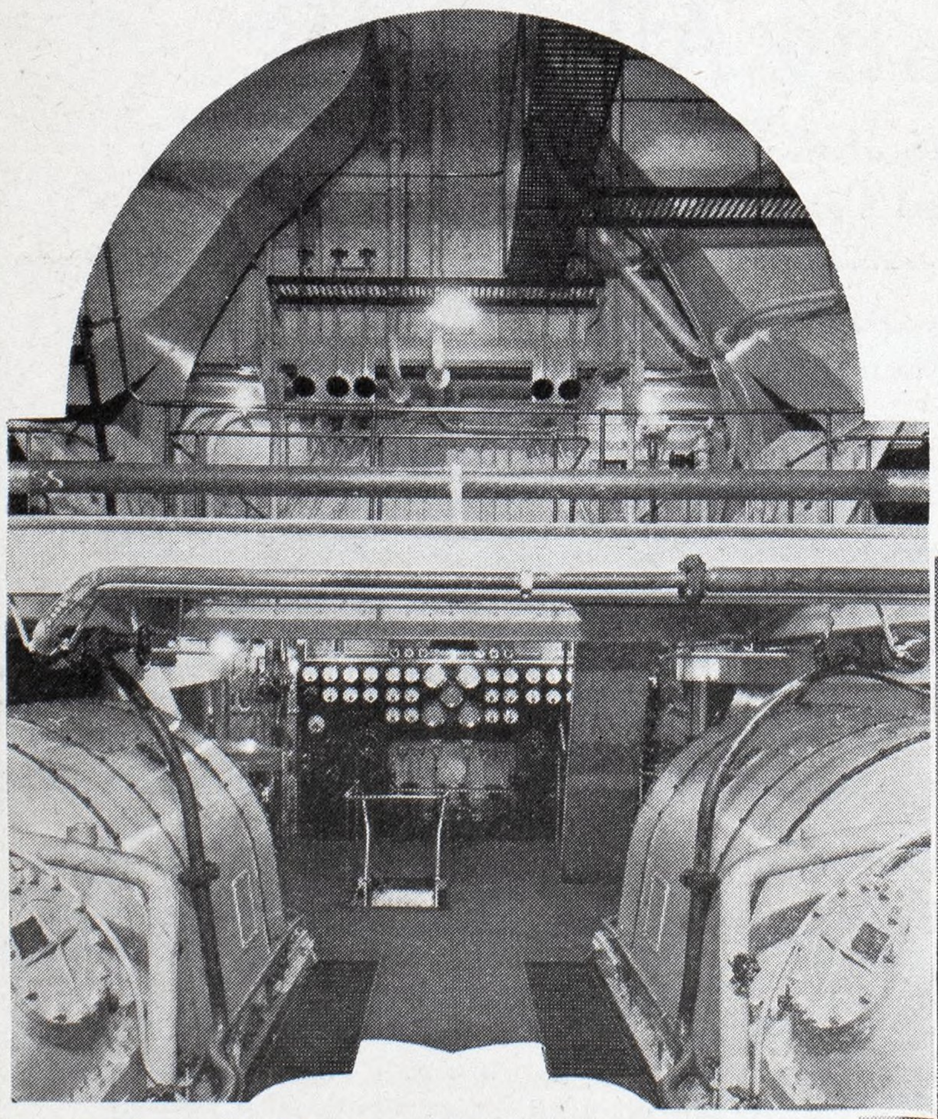




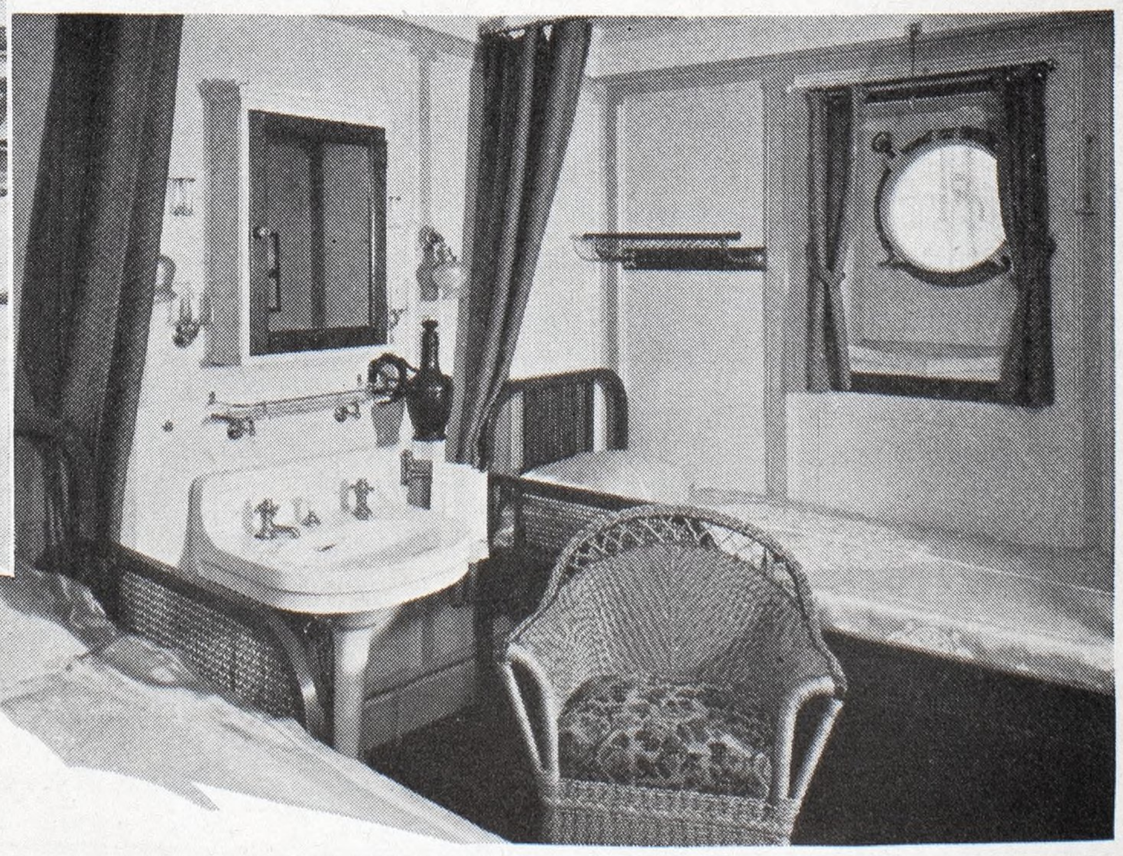


Above—Deck Promenade

Above—Navigating Bridge



Above—Engine Room Interior

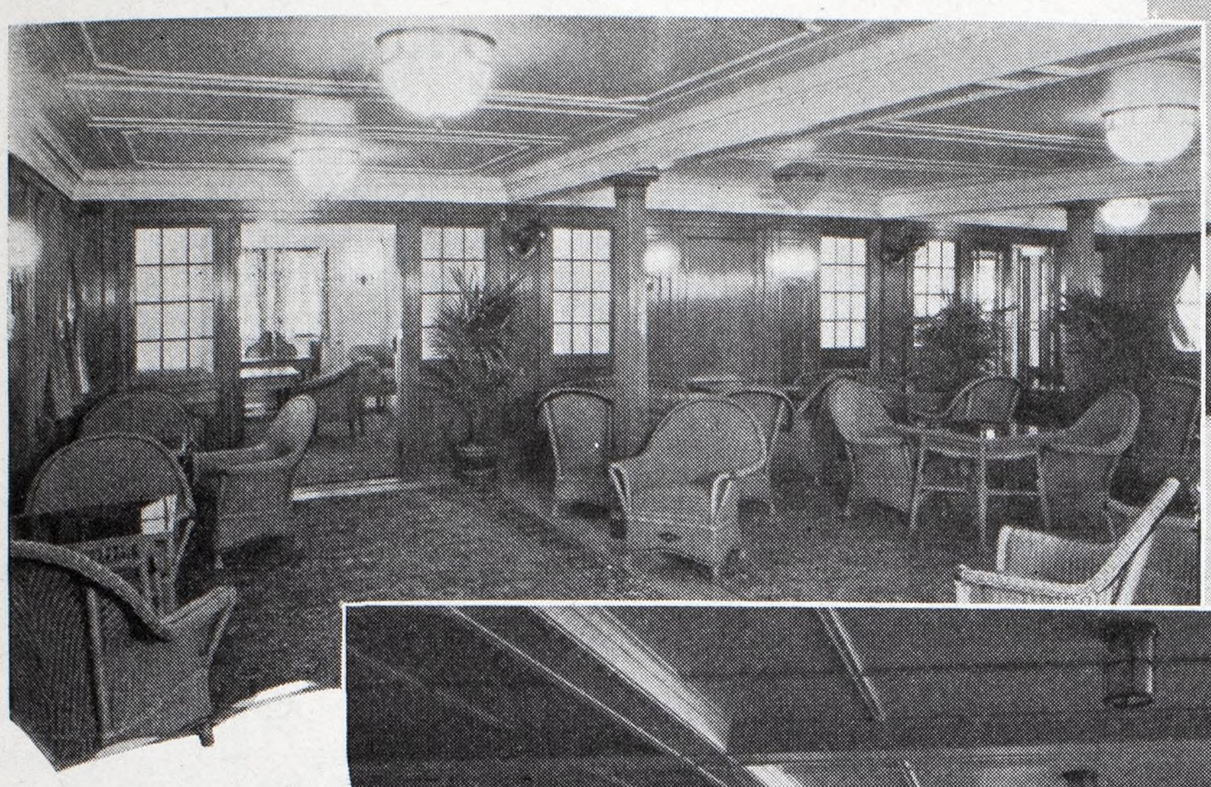


At Left—
Stateroom—
First Class

Note:—SANTA CLARA—New Grace Liner built by New York Shipbuilding Co., Camden, N. J. See MARINE REVIEW for December, 1929, and April, 1930, for details.

Enters New York-South America Run

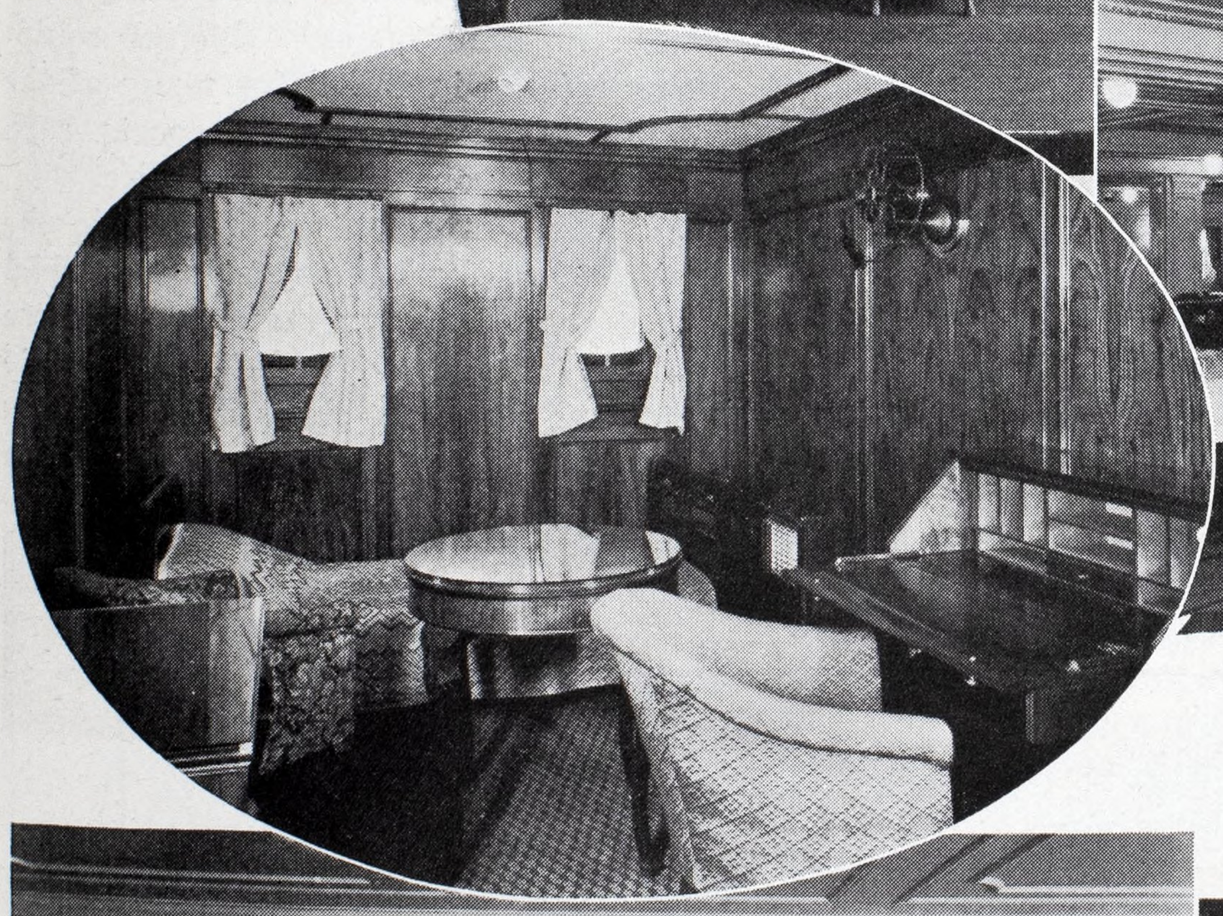
Below—Main Lobby



Above—Stateroom of Suite

At Right—
Deck
Verandah

Below — Sitting
Room of Suite



Below—Dining Room

Below—Smoking Room

Above—Music Room

New Porto Rico Liner

Will Be Named Borinquen

To Enter Service in January

WORK is progressing rapidly at the Fore River plant of the Bethlehem Shipbuilding Corp., Quincy, Mass on the new steam turbine flagship of the Porto Rico line fleet for passenger and fast cargo service between New York City, San Juan, Porto Rico, and Santo Domingo City, Dominican Republic. The new liner will be christened the BORINQUEN, the original Indian name for Porto Rico. The vessel will be commissioned for service about Jan. 1, 1931.

The BORINQUEN which is being built at a cost of $3,000,000 or more, is but a single unit of a huge shipbuilding program now being carried out by the Atlantic Gulf and West Indies Steamship lines, of which the New York & Porto Rico Steamship Co. is a member. Included also in this program are the two new Ward liners, MORRO CASTLE and ORIENTE, the former of which was launched March 5. These two ships will cost in the aggregate $10,000,000, bringing the Agwi lines' shipbuilding program now under way to a total expenditure of $13,000,000.

In preparing plans for the new flagship of the Porto Rico line fleet, it was decided after long and thorough investigation, to retain for the new vessel the general outboard characteristics and appearance of the S. S. COAMO, the present flagship which was completed Dec. 22, 1925 and which in every respect meets the requirements of the New York-Porto Rico-Santo Domingo trade. These plans were drawn by Theodore E. Ferris, naval architect and marine engineer, of New York.

The BORINQUEN is 429 feet in length overall, 414 feet between perpendiculars, 59 feet 6 inches in beam, and her designed load draft is 23 feet 6 inches. The displacement tonnage will be 11,000 long tons; gross tonnage about 7000, and deadweight carrying capacity about 4500 long tons.

Watertube Boilers and Turbines

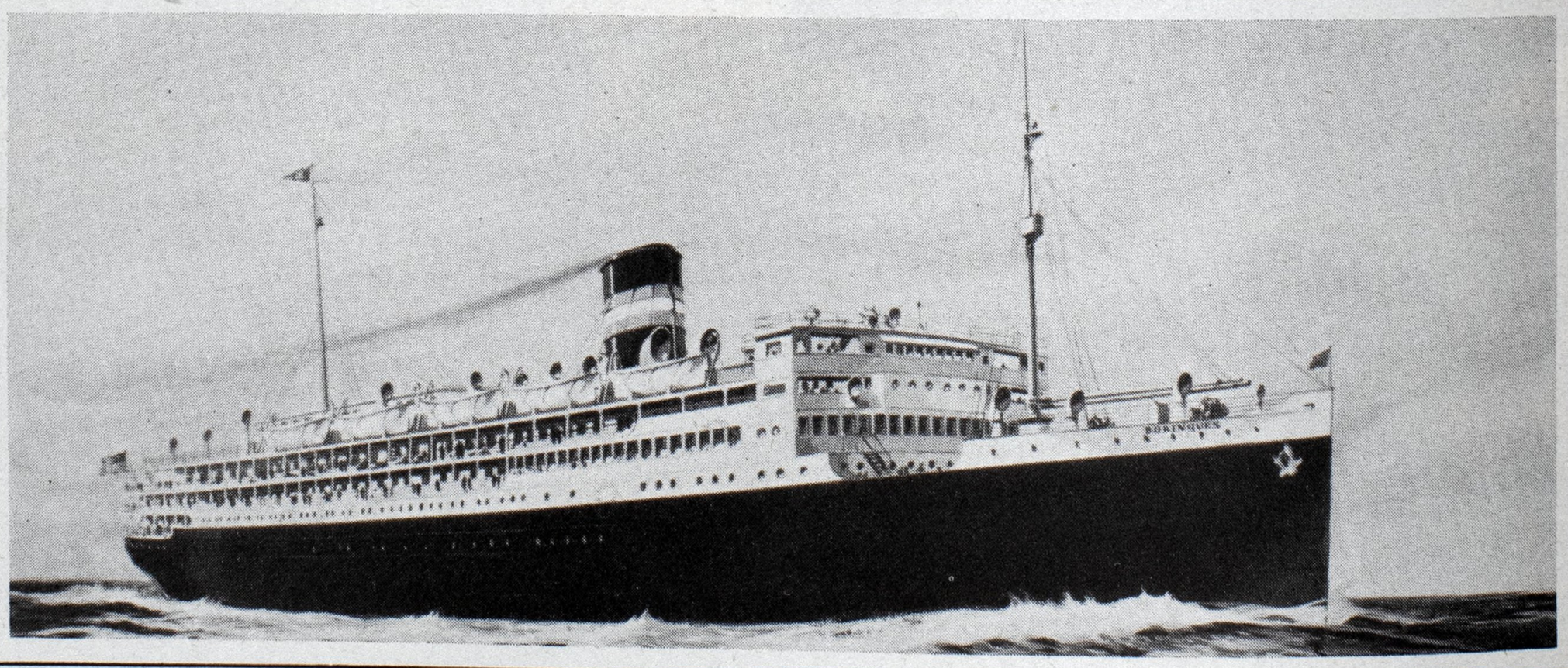
In specifying the propelling machinery advantage has been taken of the remarkable advance in marine engineering that has been made within the last few years. She will have an average cruising speed of 16 knots. Her propelling machinery will be the latest improved type of single reduction geared turbines of the reaction type, with an impulse wheel fitted at the forward end of the high power turbine.

The turbine will develop a maximum of about 6500 horsepower, steam being generated by fuel oil under four water tube boilers for a working pressure of 375 pounds, with a superheat temperature of 650 degrees, Fahr. The fuel oil tanks located in the double bottom will carry sufficient oil to insure a steaming radius of 6000 miles or more which is equivalent to seventeen days' steaming.

Accommodations for 360 passengers will be elaborate and luxurious, in keeping with the demands of present day travelers. The interior public spaces such as the main lounge and music room, dining room, smoking room, writing room, library, tea verandah and other such rooms will be elaborately and beautifully decorated and furnished to reflect in the last degree the comfort and luxury of the age.

The various decks will be lower, main, hurricane, promenade, upper promenade, and boat deck or sun deck, making available an unusual amount of outdoor space for recreation, exercise and amusement. Special equipment will be installed for many of the various deck games and sports such as are common to shipboard life.

Especial care has been taken in the designs for the cabins de luxe, special cabins and ordinary staterooms. These will, in nearly every case, be outside rooms with heavy plate-glass windows instead of portholes. All rooms in both



Artist's Sketch of New Liner Borinquen—For Service Between New York, Porto Rico and San Domingo

the first cabin and the second cabin will have hot and cold running water. Cabins de luxe will be unusually large and will have private bath and toilets. There will also be a large number of special rooms with private showers and toilets.

Careful attention is being given to details of furnishing the staterooms in a luxurious manner. Metal twin beds will be installed in all rooms with the exception of a few of the inside rooms which will have, instead, wide and comfortable berths.

Comfortable chairs, writing desks, dressing tables, chifforobes, dressing tables and mirrors, and in some rooms full-length mirror-doors; excellent curtains and draperies of fine texture and beautiful coloring and design are a few of the outstanding features that will make the first cabin staterooms, special rooms and cabins de luxe most desirable and homelike.

Fruit and other perishable cargo form a large part of the tonnage carried from Porto Rico to New York.

Large Refrigerating Plant

To properly care for this a refrigerating plant is being installed, and the greater part of all cargo space is being insulated and may be chilled for the safe handling of such shipments. In addition, a thoroughly modern pre-cooling plant at the company's pier at San Juan, was completed on Feb. 1. Its capacity is 20,000 cases of fruit. Perishable cargo may be held here as long as may be necessary, prior to shipment, under ideal conditions for its preservation.

Specially constructed for service in tropical waters, great care is being taken in the construction of the BORINQUEN and in the installation of ventilating systems throughout, to meet satisfactorily all climatic conditions. All the public spaces, passenger staterooms, crew's quarters, and all working and storage spaces will be efficiently served by mechanical ventilating systems.

All the latest improved navigational aids have been adopted for the new flagship, including the Sperry gyroscope compass; and for protection against fire, a smoke-detecting and automatic fire-indicating system to fully cover every part of the ship. The BORINQUEN will carry a crew of 154 officers and men, including the members of the orchestra who will furnish music for daily morning and afternoon concerts, and for dancing in the evenings.

National Marine Conference Convenes

AMERICAN merchant marine problems, including the construction program which has resulted from the passage of the Jones-White law, were discussed at the third national conference on the merchant marine which met in Washington April 23 and 24, according to the official agenda made public by the shipping board on March 28, under whose auspices the conference was announced. Invitations to attend were sent to outstanding figures in the shipping world by T. V. O'Connor, chairman of the board an it was estimated that the attendance this year was very much larger than in previous years in view of the many matters of prime importance which were pending at this time.

Chairman O'Connor of the shipping board opened the conference on April 23 with the following remarks:

"On behalf of the United States shipping board I bid you welcome to the third national conference on the merchant marine.

"Those of you who attended the previous conferences are aware of the great good that has come from these annual meetings of our shipping interests in speeding the development of a strong American merchant marine. The results achieved have prompted the board to call you together again. In addition to the unfinished business carried over from a year ago, there are other important problems that require attention, which cannot be solved without your active assistance.

"Looking back along the road we have traveled we see that there was a time, not long ago, when there were only a few private American shipowners and operators. During the past few years this condition has changed, for today most of the vessels of the vast war-built fleet are being operated by private American citizens.

"With the government's retirement from the operating field, there is naturally coming about a marked change in the character of the Board's activities.

"The construction in war time of about 2300 vessels has become an old story, and I do not propose to dwell upon it further than to remind you that the building of these ships involved the creation of more than 250 additional shipyards; the training of 385,000 shipyard workers; the building of some 20 modern villages, composed of dwelling houses, hotels, stores, and other structures, with special railway and sanitary facilities, light and power plants, schools, hospitals, and water systems.

"The next stage in the board's activities was the period during which it utilized its more suitable vessels for establishing regular shipping service on the necessary foreign trade routes. A survey of the needs of American commerce was made and regular services were organized from American ports on the Atlantic, Gulf, and Pacific, to the markets of Europe, South America, the Orient, and Africa. On some of these routes there had never been regular shipping services under the American or any other flag.

"The third chapter involved the sale to private American interests of the lines so established. We are still engaged in that work.

"The fourth chapter concerns the future, in which the board, released at last from its operating responsibilities, will be free to devote its thought and energy to the administration of the shipping laws and the development of a merchant marine worthy of this great country.

"In this brief mention of the shipping board's changing activities it should be emphasized that the board has made great progress in its liquidation program. The thing has not been as easy as it looked, since the object to be attained was not only to get the Government out of the shipping business, but to enlist private American capital in the shipping business.

"The board has succeeded in selling a total of 1879 ships for approximately $280,000,000. Of these 171 went into American foreign trade. A total of 543 ships were sold for scrap. Today the shipping board has but 471 vessels, of 3,960,000 deadweight tons, 217 of these vessels being in active operation.

"I have referred to the regular shipping lines established by the board on the world's principal trade routes. At one time the board had 80 of these lines, the number subsequently being reduced to 38. Today but 17 of these lines remain under government ownership, the others having been sold to private American interests, with satisfactory guarantees of continued operation.

"With this reduction in government operations, great retrenchment has been possible in salaries and general expenses. In 1924 our payroll showed a total of 5535 persons, at an annual salary expense of $9,499,825. On March 31, 1930, the total personnel consisted of 1799 persons, at an annual expense of $3,288,513.

In 1924 the congressional appropriation for shipping board account amounted to $50,000,000. For the coming fiscal year it is $6,000,000.

"Mail contracts authorized by the merchant marine act of 1928 have been awarded, or are in process of award, for the maintenance of services on a large number of essential routes. These contracts assure the construction, in American yards, of approximately 64 ships, totaling 675,000 gross tons, most of which will be completed during the next five years.

"The shipping board, under its authority to grant loans to American citizens for building or reconditioning merchant ships, has to date made loans totaling $77,000,000. These loans are proving highly beneficial in the building up of the American merchant marine.

"Your attention is invited to the fact that during this time our trade with Europe has increased 50 per cent, with South America 200 per cent, with Africa 325 per cent, and with Asia 380 per cent. During the 10-year period during which shipping board lines were established and developed, the expansion of our waterborne foreign trade has been greater than in any other similar period in our history.

"I have referred to some of the board's past activities, not in a spirit of boasting, but rather with the idea of showing that in the normal course of events the character of its work is gradually changing. Within a few years the board will have no more ships for sale. It will then be able to give its attention to the less spectacular but more important part of its duties, namely, the promotional, regulatory and development work entrusted to it by law, and much has already been accomplished along these lines.

"The future will see the shipping board making every effort to assist American shipowners to reduce the costs of operation, and to assist American shipbuilders to reduce the existing construction differential. Our traffic problem, which is chiefly to get more American shippers to use American ships, will be greatly simplified when all our shipping companies are in a position to offer service at least equal to that offered by our competitors. It will be among the board's tasks to help solve this and other traffic problems, to handle cases of unfair competition and unfair practices, to develop our navigation and safety laws, to engage in marine research, to investigate methods of ship finance and insurance, and to perform the many other tasks which are part of the board's more important duties in connection with the work of building up and protecting the American merchant marine.

"At this time general conditions in world shipping give rise to considerable anxiety. Freight offerings have fallen off to the lowest point in years; there is much idle tonnage; and rates are low, but we look to the future with confidence. The difficulties which lie before us seem small compared with those we have overcome in the past. With your co-operation the shipping board will do its utmost to make the American merchant marine justify our fondest hopes.

The work of the second conference, which was held in January of last year, was continued by committees which had been appointed to study some of the more important subjects and submit their final recommendations to the shipping board. It was agreed that upon the receipt of a sufficient number of committee reports to warrant such action, the board would call another conference to consider the recommendations and other matters that might come up for attention. Five of the committee reports are at hand and ready for further consideration of the conference as a whole. These reports deal with the following subjects: Reduction of differential between shipbuilding costs here and abroad; methods of increasing patronage for American ships; marine insurance; mail contracts and government aid to American ships not benefited by mail contracts.

Other subjects which will be dealt with are as follows: Construction program under the Jones-White act; co-operation between shippers and ship operators in the use of American ships; relation of American railroads to the American merchant marine; what the Government is doing abroad to aid American shipping; marine engineering development and research; work of American Marine Standards committee; American port development; efficiency in cargo handling; training of merchant marine officers; safety of life at sea and load line regulations; safety of marine workers; Merchant Fleet corporation activities; Great Lakes-Atlantic waterway.

In issuing the call for this conference Mr. O'Connor expressed the gratification of the shipping board for the unity of spirit with which the members of the American shipping industry have approached the problems of the American merchant marine at these annual conferences.

The speakers in connection with the reports listed above include the following: J. L. Ackerson, special expert, bureau of construction, United States shipping board; Homer L. Ferguson, president, Newport News Shipbuilding & Drydock Co.; H. G. Smith, president, National Council of American Shipbuilders; Franklin D. Mooney, president, Atlantic, Gulf and West Indies Steamship lines; Frank C. Munson, president, Munson Steamship line; Malcolm M. Stewart, chairman, Middle West Foreign Trade committee; E. J. McCormack, treasurer, Moore & McCormack Co.; Hon. James H. MacLafferty, vice president, Pacific American Steamship association and Shipowners' association of the Pacific coast; Robert F. Hand, vice president, Standard Shipping Co.; Frank C. Gregory, safety engineer, United States employes' compensation commission; Charles B. Hosmer, in charge of shipping section, United States consular service, state department; Admiral H. I. Cone, commissioner, United States shipping board; Admiral D. W. Taylor, U.S.N., retired; E. H. Rigg, naval architect, New York Shipbuilding Co.; Maj. Gen. Lytle Brown, chief of engineers, war department; Dr. Boris Stern, special agent, United States department of labor; Joseph P. Ryan, president, international Longshoremen's association; W. F. Yates, president, National Marine Engineers' Beneficial association; Capt. J. F. Milliken, secretary-treasurer, Neptune association; Andrew Furuseth, president, International Seamen's union; Admiral J. G. Tawresey, C.C., United States Navy, retired, representative, United States shipping board on United States delegation to international conference on safety of life at sea, London, 1929; C. P. Craig, executive director, Great Lakes-St. Lawrence Tidewater association; Hon. S. Wallace Dempsey.

Shipbuilders Council Elects Officers

At the annual meeting of the National Council of American Shipbuilders in New York on April 16 Mr. H. G. Smith was re-elected president and Capt. Roger Williams of the Newport News Shipbuilding & Dry Dock Co. was elected vice president to succeed Frederick P. Palen. Henry Hunter was re-elected counsel-treasurer and Clifford C. Knerr was re-elected secretary.

To Launch Oriente

The steamer ORIENTE, sistership of the MORRO CASTLE, is scheduled for launching at the yard of the Newport News Shipbuilding & Dry Dock Co. on May 15. Both the ORIENTE and MORRO CASTLE were designed by Theodore Ferris, for the New York-Havana run of the Agwi Steamship Co.

European Shipping at Low Point

Freights Keep on Declining—More Ships in Layup—Shipbuilding Active—Less Naval Work—To Build 1000-Foot Ship

By Frank C. Bowen

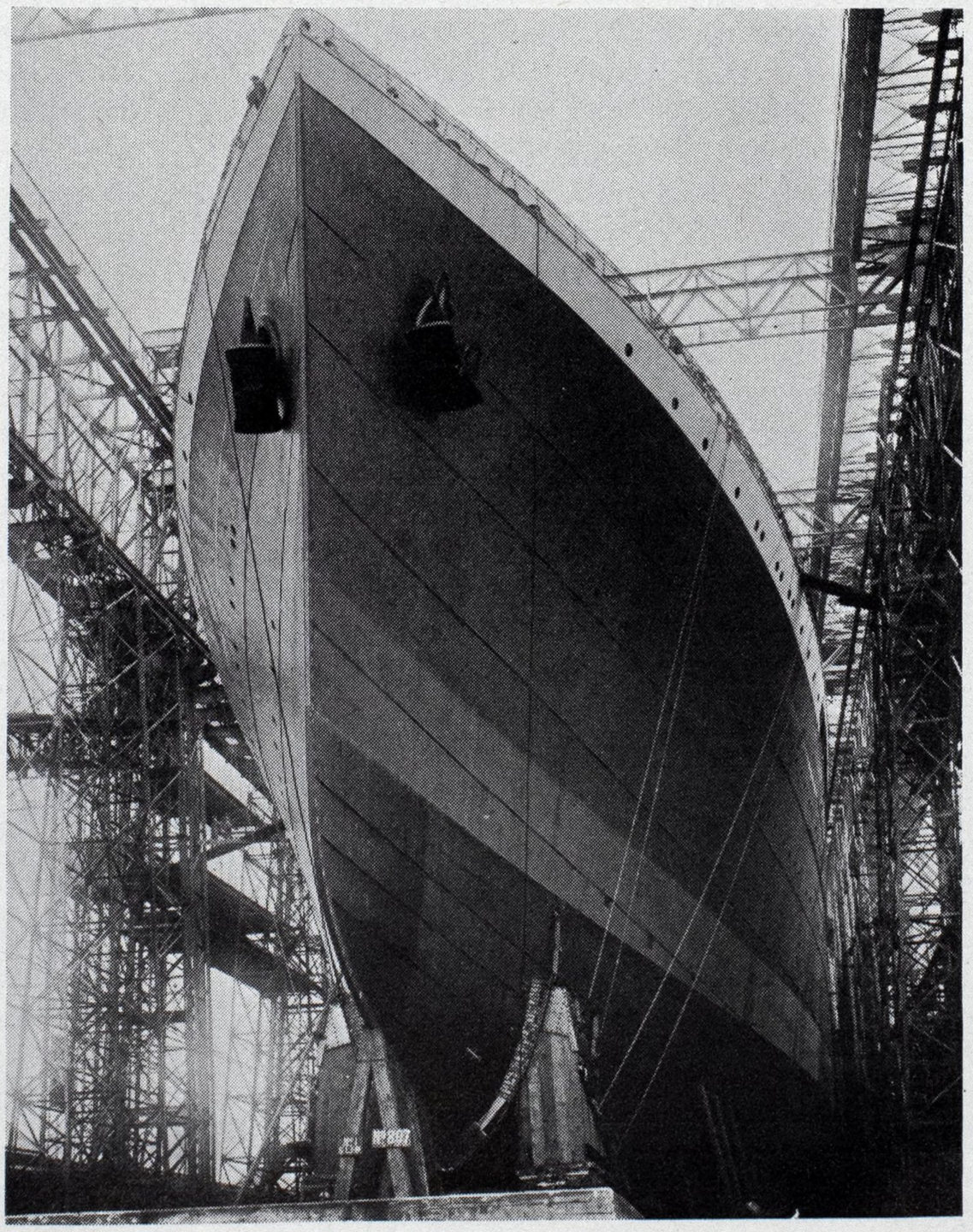
THE year 1930 opened in a depressed condition for European shipowners, for freights were lower than they had been for a long time past, the demand for grain being particularly disappointing. At the beginning of the year it was considered that rock bottom had been reached, but the succeeding weeks showed that freights could go down further still, and at the end of the period the actual bottom could not yet be seen.

The natural result of this has been for a large number of ships to be laid up, particularly in Great Britain and Ireland. On Jan. 1, 352,659 net tons were laid aside in the various British ports, a 32 per cent increase as compared with Oct. 1, but from then onwards the number steadily went up and all the ports offering cheap laying-up facilities soon were filled. Ships which had gone out to the River Plate in ballast in the hope of picking up a cargo had to come home in the same condition, and there is every indication that many of the smaller tramp firms will not prove able to weather the storm. For some years past there always has been a reasonable market for a certain number of sailing ships bringing Australian grain home to the United Kingdom continent, and although the freights did not permit very many replacements, the ships could make both ends meet on them, especially those under various Scandinavian and Baltic flags. This season, £1 or £1 1s ($4.87 or $5.11) has been the most that any of these ships could hope for, while extreme cases are the 14s 6d ($3.53) which the C. B. PEDERSEN accepted and the 13s ($3.17) which was all that the big four-masted barque PENAG could get and which her owners refused. One handicap under which the sailing ships work nowadays was shown by the readiness of Lloyd's underwriters to believe the worst when a water-logged boat from the barque KILLORAN was discovered. On no better evidence than this, the reinsurance rate mounted steadily to £42 ($204.39) per cent when she turned up safe and sound at her destination after a by no means unduly protracted voyage. The surviving sailing ships are covered at a very low value, and the underwriters have been badly bitten by them, but the rates which they have to charge to protect themselves are ruinous to the very few remaining windjammers.

On the shipbuilding side in England the year began quite well, although there were, and still are, fears that the orders will drop off rapidly later in the season. The demand of the Norwegian companies for tanker tonnage, mostly motor-driven, still is unsatisfied, and the orders that come from that source are very welcome, although latterly there has been some nervousness concerning the financial side.

Great Britain still lags somewhat behind the rest of the world in its enthusiasm for motorships, although a large number now are under construction. At the beginning of the year, 49.1 per cent of the total tonnage under construction in Great Britain and Ireland was to be driven by diesel engines, while abroad the percentage was 62.7. It is, of course, natural that British industry should stick to coal as long as it possibly can, while the experiment made in the use of pulverized coal at sea had attracted great attention and generally speaking, had been successful. There have of course, been a certain number of minor mechanical breakdowns, but that is only to be expected with a new system, and there is the significant fact that not a single firm which has tried the system has seen fit to remove it, while every one which started in a small way with part of a ship's boiler equipment only has taken steps to convert the whole.

The policy of the present British government to reduce naval shipbuilding wherever possible, quite apart from any agreement that may be reached with the other navies of the world, has hit the shipbuilding industry hard, and a further blow has been dealt by the decision of the navy to build all types, even destroyers, in the Royal dockyards in preference to accepting private contracts. Although it has not yet had time to start operations, the scheme for rationalizing British shipbuilding and doing away with the numerous berths which now are surplus to requirements has attracted great attention. James Lithgow, the well-known Clydeside shipbuilder, is one of the moving spirits, and the scheme has the very active support of some of the best known men in British shipbuilding. A limited liability company has been floated for the purpose, having a small capital, but very large borrowing powers, and in the articles of association they state that their purpose is to purchase, and if necessary dismantle, British shipyards. In Germany



M. S. Britannic—Before Launching—Showing Conventional Body Lines

the rationalization scheme which was carried out by the Deschimag, although bitterly criticized, as was only natural, appears to have been very tolerably satisfactory in its working, and the promoters of the scheme certainly feel that they were justified in their action.

French shipbuilding is working hard for further protection and assistance from the state, although there is considerable disagreement as to just what form the help should take. The fact that the Compagnie Generale Transatlantique went to a Belfast yard for six fast cargo ships for the New York service attracted great attention, and clearly showed that there was something wrong, while another French firm placed the contract with Britain, although they actually own a shipyard themselves.

Not only the bigger ports, but also the smaller ones, are undertaking improvements and development. At the beginning of the year Southampton put under way a further dredging program in connection with a huge scheme for development, this section being estimated to cost about £240,000 ($1,167,960). Similarly in the Port of London the development of Tilbury docks, the most seaward section of the system, is proceeding steadily, although the great majority of the ships using the port prefer to go further up stream. The floating passenger stage, 1050 feet long, is practically ready, and is to be opened in May, when it is anticipated that the port will again attract the big passenger business for which is was once famous. At the present time the facilities for passengers are admittedly poor, and many liners use London for cargo only, picking up their passengers at Southampton or one of the other Channel ports. Although not as big as the Princes landing stage at Liverpool, the new Tilbury stage will be up-to-date in every particular, with all the necessary customs examination rooms, waiting rooms and the like. Its one disadvantage is the tide that races past it.

Far and away the most important of the new ships completed during the quarter is the North German Lloyd EUROPA, which should have been ready for last year's passenger season, but which was delayed owing to a serious outbreak of fire while she was fitting out. She differs in many respects from her sister ship the record-breaker BREMEN, and keen rivalry is to be expected between the two for the blue riband. Externally, the most conspicuous difference is that the streamline funnels which have attracted so much attention in the BREMEN have been abandoned, and the EUROPA has been given large oval funnels. Many authorities are doubtful as to the real benefit of the novel shape.

The White Star line last year laid down at Belfast the OCEANIC, of over 1000 feet in length, but no decision was arrived at as to the machinery which she was to be given, and before work had been in progress long it was suspended. The slip now has been cleared, and the company has decided to lay down immediately a 27,000-ton cabin motorship which is to be a sister to the BRITANNIC, which shortly will be in service. Both the cabin and third tourist services of the European lines have been particularly busy, and the company sees in the smaller ships better prospects of immediate profit.

At the same time it is plainly announced that the idea of building a giant liner is not abandoned, the determination of the directors having been strengthened by the plans of the United States Lines. When she will eventually be laid down is not known, and the details of her engines still are most uncertain, although it has been announced that she will have some form of electric drive.

The Cunard company, which has had plans of a 1000-foot record-breaker in existence for some years past, took a definite step at the end of the quarter and sent out tender-forms to John Brown & Co. Ltd., of Clydebank, who built the LUSITANIA and the AQUITANIA, Swan, Hunter & Wigham Richardson Ltd., on the Tyne, who built the MAURETANIA and Vickers-Armstrong Ltd., who were responsible for part of the company's post-war fleet. Innumerable rumors have been given currency concerning the features of this ship, including a speed of 30 knots, but these are accepted with the greatest reserve, and the Cunard company is most careful not to publish anything officially or to confirm any of the stories.

It is, however, definitely known that she will be designed to make an attempt on the blue riband, whose possession was of the greatest value to the Cunard line for a number of years. The North German Lloyd express themselves as being very well pleased with the financial results of the BREMEN, not only herself, but indirectly through the other ships of the fleet.

The British Trend of Trade and Shipping

	January	February	Two months ended Feb. 28, 1930	1929
Total entrances of cargo ships into British ports:				
Number of vessels	4,247	3,931	8,188	7,610
Tons	4,786,143	4,270,255	9,075,049	8,587,001
Tonnage from Atlantic coast of North America	748,486 (15.7%)	675,457 (15.8%)	1,426,944 (15.8%)	1,570,405 (18.3%)
Total clearances from British ports:				
Number of vessels	5,380	4,680	10,064	9,622
Tons	5,788,351	4,952,900	10,760,180	10,030,681
Tonnage going to Atlantic coast of North America	673,460 (11.7%)	577,135 (11.7%)	1,250,595 (11.7%)	1,303,483 (13.1%)
Total value of goods:				
Exported	£66,436,377	£60,570,838	£127,007,215	£152,656,160
Imported	£101,853,658	£88,210,096	£190,063,754	£207,399,633
Exports of coal:				
Tons	5,493,410	4,735,657	10,229,067	8 362,661
Value	£4,710,268	£4,058,775	£8,769,043	£6,525,797
Tonnage shipped for use of steamers	1,338,701	1,277,642	2,616,343	2,605,125

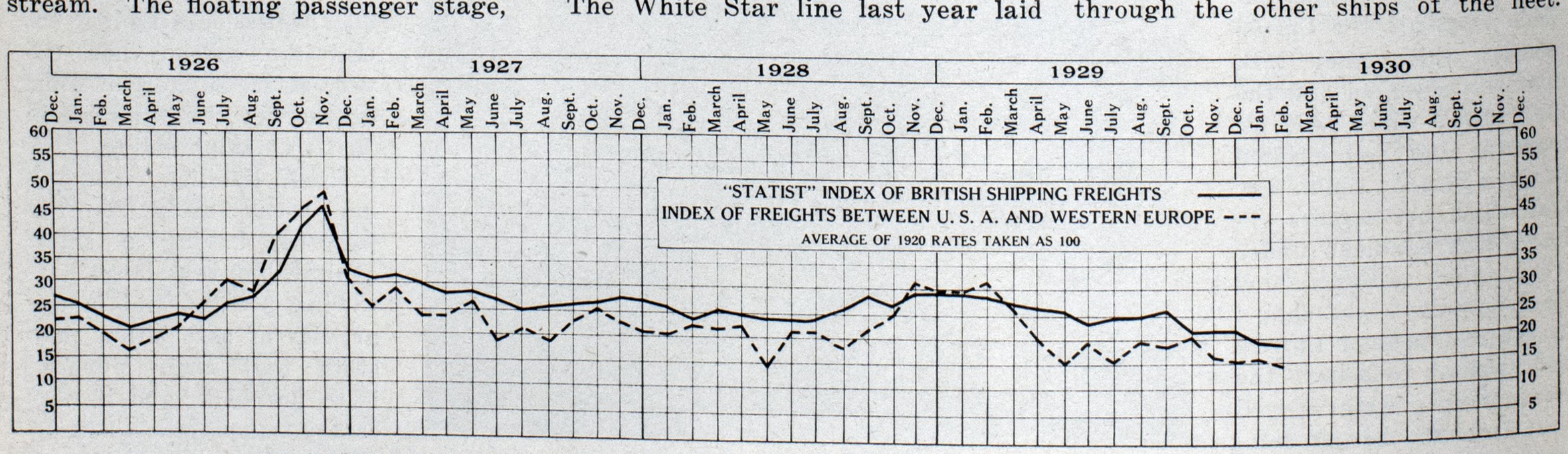


DIAGRAM SHOWING FLUCTUATION OF FREIGH T RATES FOR FOUR YEARS AND TWO MONTHS

That is repeating their experience with their first record-breaker, the KAISER WILHELM DER GROSSE, which took them from a comparatively low position on the Atlantic table and in a single year gave them 24 per cent of all the passengers entering the port of New York.

Italy also has taken definite steps toward entering the competition for the blue riband, for her transatlantic shipping is depending more and more on the tourist and luxury traveler to whom the record-breaker appeals. The Navigazione Generale Italiana and the Lloyd Sabaudo have each laid down a ship of this class, and they are to run in some conjunction. They are, of course, receiving considerable assistance from the Italian government in this plan, and in return are running the ships to the ideas of the state, but the position to which the Lloyd Sabaudo has climbed during a comparatively short life is shown by the fact that not only does it propose to build this ship without issuing extra capital, but is making preparations to pay off the 1926 American loan 11 years before it is due. The French Compagnie Generale Transatlantique record-breaker will not be laid down until later in the year, although work now is in progress to prepare the slip for her construction.

After making a somewhat slow start compared with the United States, turboelectric machinery now is firing the imagination of British shipowners. Having tried the system in the 19,000-ton VICEROY OF INDIA on the Bombay run, the P. and O. line has given a contract to Armstrongs Ltd. for two similar ships, slightly bigger, for the Australian mail service. Furness, Withy & Co. Ltd. have gone to the same firm for the 23,000-ton turbo-electric steamer EMPIRE STATE which is to be put on the New York-Bermuda service.

The Bauer-Wach system of combining reciprocating engines and turbines is making rapid progress both in Britain and on the continent; several of the cargo and minor passenger ships now are being constructed with it, and more are being converted. The P. and O. and Ellerman lines have adopted a slightly different system, the exhaust turbine generating electricity for a motor geared to the shaft, and have attained successful results.

As far as the passenger business is concerned, and to a certain extent the finer cargo, the prospect for the next few months is regarded as being promising, but the position of the tramp business is desperate and there appear no signs of early improvement.

Launch Coast Guard Cutter Saranac

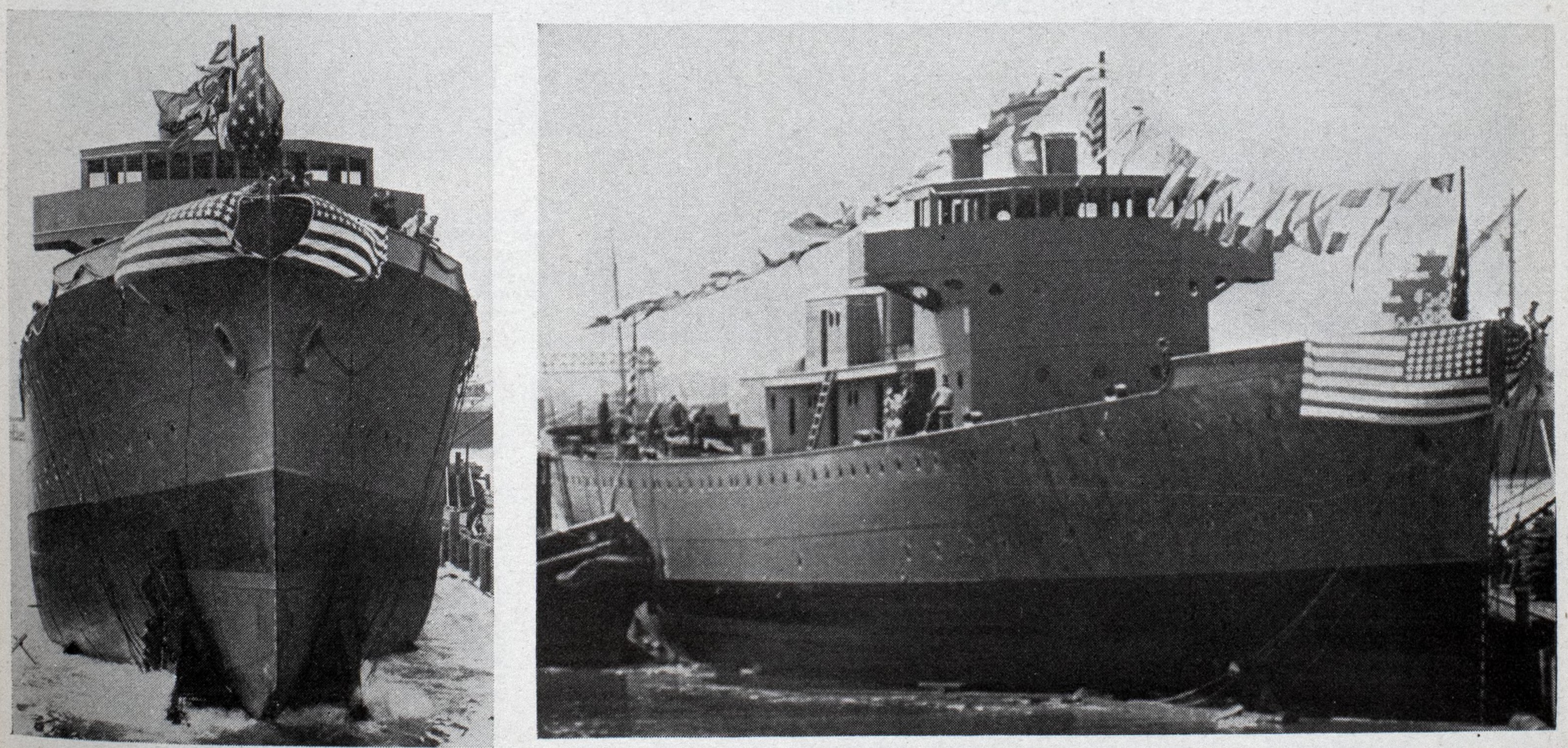
WORK is progressing on the four coast guard cutters building at the General Engineering and Dry Dock Co. for the government. The first two vessels, the ITASCA and the SEBAGO were launched Nov. 16, 1929 and Jan. 15, 1930 respectively. The third of the four vessels, the SARANAC, was launched April 12, 1930 at the company dock at Oakland, Calif.

The SARANAC, which is similar to the other vessels of the class, is 250 feet long overall, 236 feet between perpendiculars, 42 feet molded breadth, 26 feet 10 inches molded depth and 15 feet draft. The displacement loaded is 200 tons. Bunker fuel oil capacity 90,000 gallons. The cruising radius is 8000 miles and service speed 16 knots.

The main engine is a steam turbine designed and built by the Westinghouse Electric & Mfg. Co. It is direct connected to an alternating current generator also built by Westinghouse. The turbine is of the impulse reaction type suitable for operation with 260 pounds of steam, 175 degrees superheat and 28½ inches of vacuum. At full speed of 3600 revolutions per minute this engine will develop 3220 horsepower at the motor. The motor is the synchronous type direct connected to the propeller shaft.

The vessel is fitted with two Babcock & Wilcox watertube oil burning boilers with a total heating surface of 6336 square feet and total superheating surface of 696 square feet. Working pressure is 260 pounds per square inch.

Power for the auxiliaries, excitation and lighting is supplied by four generating sets, three turbine driven and one driven by an alternating current induction motor. The direct current generator at 240/120 volts is for excitation only. All electrical equipment has been supplied by the Westinghouse Electric & Mfg. Co.



LEFT—LAUNCHING THE SARANAC, THIRD OF FOUR COAST GUARD CUTTERS BUILDING AT GENERAL ENGINEERING AND DRY DOCK CO., OAKLAND, CALIF.. RIGHT—THE SARANAC AFTER LAUNCHING

Study Foreign Markets

The seventeenth annual National Foreign Trade convention will be held in Los Angeles on May 21 to 23. From present registrations upwards of 2000 delegates, representing 35 states and all important industries in the country, will attend. The general export and import business of the country will be closely scrutinized especially as regards trade prospects with Latin America and the Far East. According to figures issued by the National Foreign Trade Council, American manufactured exports as of March 1 were within 2 per cent of the last fiscal year's record of $2,500,000,000. An interesting program of papers has been announced. O. K. Davis, who is secretary of the National Foreign Trade Council, is located at India House, 1 Hanover square, New York.

Building Diesel Ships

On March 1 the number of motorships under construction or on order equipped with diesel engines of the Burmeister & Wain type was 157. The indicated horsepower of these ships is 747,837, the deadweight tonnage 1,276,245 and the gross tonnage 991,050.

Report on Pensacola

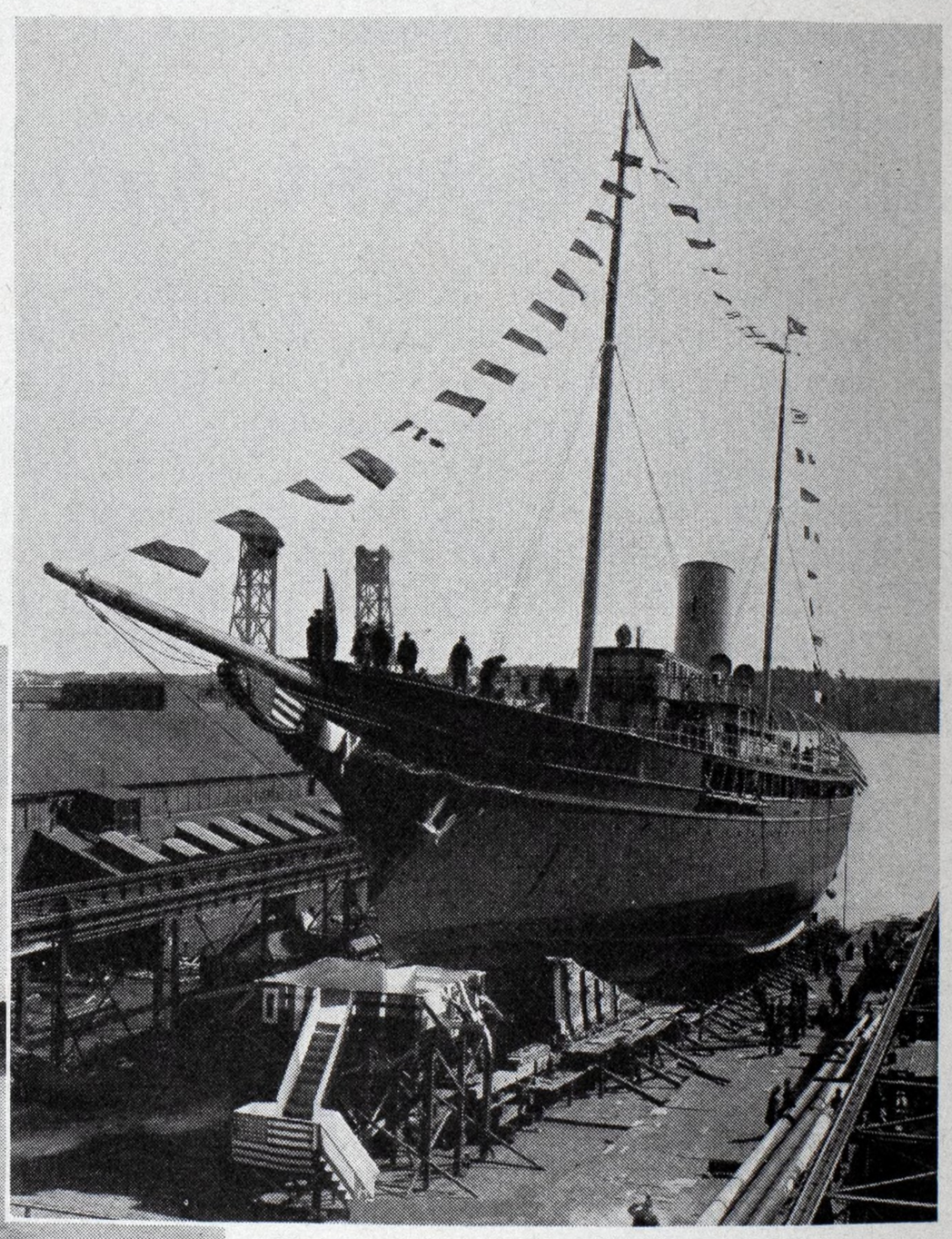
Port Series Report No. 3, Part 2 on the Port of Pensacola, Fla., recently issued by the board of engineers for rivers and harbors of the war department, in co-operation with the United States shipping board is a revision of the data originally issued in 1922. The report contains information regarding port and harbor conditions regulations, fuel and supplies and all facilities available for service to commerce and shipping.

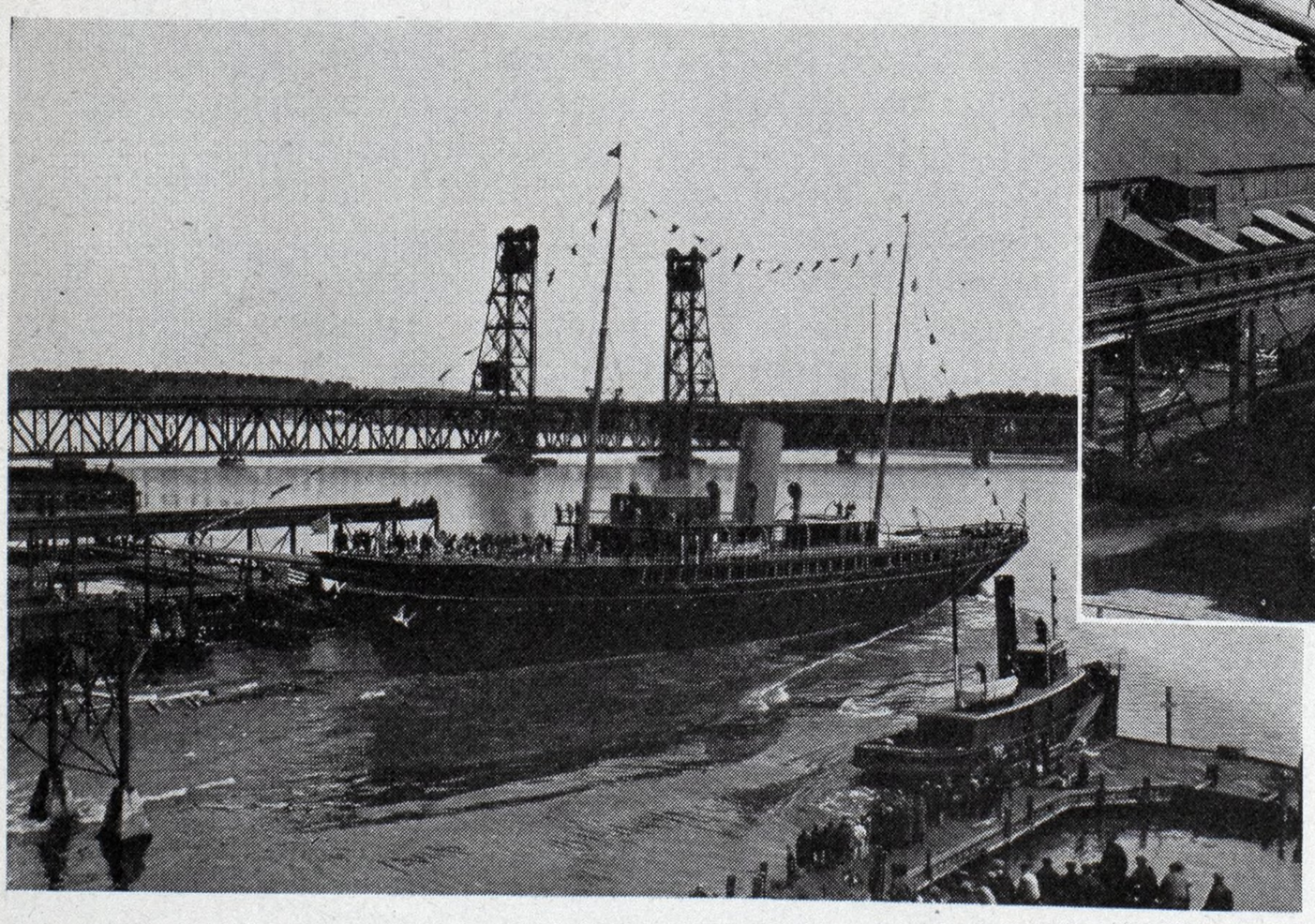
Copies of the report may be obtained for 30 cents from the superintendent of documents, Washington.

Corsair—New Morgan Yacht Launched at Bath

THE new CORSAIR for J. Pierpont Morgan was launched at the Bath Iron Works Corp., Bath, Me., on April 10, at 10:17 a. m. This magnificent vessel is 343 feet 6 inches in length overall; 280 feet in length on the 18-foot waterline; 27 feet 1 inch in molded depth; 42 feet 8 inches in molded beam; and the designed draft is 18 feet. An estimated cost of the completed vessel is $2,500,000.

The CORSAIR was designed by Henry J. Gielow Inc. and follows somewhat the general outboard characteristics of its predecessor, built for the elder Morgan in 1899. She has twin screws, each driven by an electric motor, the current for which is generated by turbine generating sets, steam being supplied by Babcock & Wilcox water tube boilers burning oil.





Total horsepower will be about 6000 and the average speed 16 knots. Nothing will be spared to equip and furnish the Corsair to make her one of the most modern and luxurious private yachts in the world.

Observed Launching Data for the Yacht Corsair

Max. velocity.....22.8 feet per sec.
Max. acceleration.....2.01 feet per sec.
Distance run to pivot, calculated 362 feet
Distance run to pivot.....actual 330 feet
Time start to pivot.....24.4 seconds
Time start to full afloat.....26.0 seconds
Center of Gravity, as launched,
127′ 7″ forward of aft perpendicular
Draft, aft.....13′ 11½″ above base line
Draft, forward.....17′ 3″ above base line
Draft, mean.....15′ 7¼″ above base line
Total trim.....3′ 3″ from designed line
Weight of sliding ways and poppets...30 tons
Weight of ship (without water in tanks)
1938 tons
Weight of water ballast.....254 tons

Total launching weight.....2222 tons

Distance, centers of ways, ft., in.....14-0
Length standing ways, feet.....400
Length standing, ways beyond stern post, ft., inches.....137-6
Width of standing ways, inches.....23
Declivity of standing ways, inch per ft...0.78
Declivity of slip, inch per ft.....0.625
Length of sliding ways, effective ft.....236
Width of sliding ways, inches.....23
Area of sliding ways, effective, sq. ft.....905
Pressure on sliding ways, including weight of ship and ways, tons per sq. ft.....2.46
Length of fore poppet base, ft.....12
Width of fore poppet base, inches.....23
Area of fore poppet bases, sq. ft.....46.0
Pressure on fore poppet at pivoting point, calculated...275 tons or 5.98 tons per sq. ft.
Distance from water's edge on slip to sternpost—sternpost 10 feet abaft water's edge
Nature of lubricant used,
Paragon stearine and grease
Depth of water over end of ways
Expected 8 feet 6 inches
Actual 8 feet 3 inches
Max. depth of water was at 9:50 = 8 feet 6 inches
Tanks filled with fresh water, tons....253.5
Temperature of air.....54 degrees
Temperature of grease.....40 degrees
Wind, N. E. 15 miles per hour.
Miscellaneous Notes: Port anchor was dropped when ship was full afloat. Before "sawing off", ship pulled down ways 1⅜″. Ship started before saw logs were completely sawed. Oak left = 1½″ x 24″ port, 1″ x 24″ starboard. After launching, ship had no list either visibly or by actual measurement at amidships.

Lake Season of 1930 Opens

Vessel Men Hold Annual Meeting

By A. H. Jansson

IN ACCORDANCE with established custom the Lake Carriers association held its annual meeting at Cleveland on the third Thursday of April (April 17). This is the twenty-seventh year since the association was incorporated. Though navigation officially opens on April 15, ice on the upper lakes this year is likely to delay actual operation on a large scale until about May 1. The allowable opening draft is 19 feet 9 inches which is 3 inches deeper than last year when it was 19 feet

A. F. HARVEY
Elected Chairman, Lake Carriers

6 inches. In the annual report of the president, which was distributed in book form sometime ago, it was pointed out that the year 1929 broke all previous records for bulk cargo carried. The total net tons of ore, coal, stone and grain for the season of 1929 was 138,574,441, an increase of 11,245,091 net tons over the preceding record year, 1928.

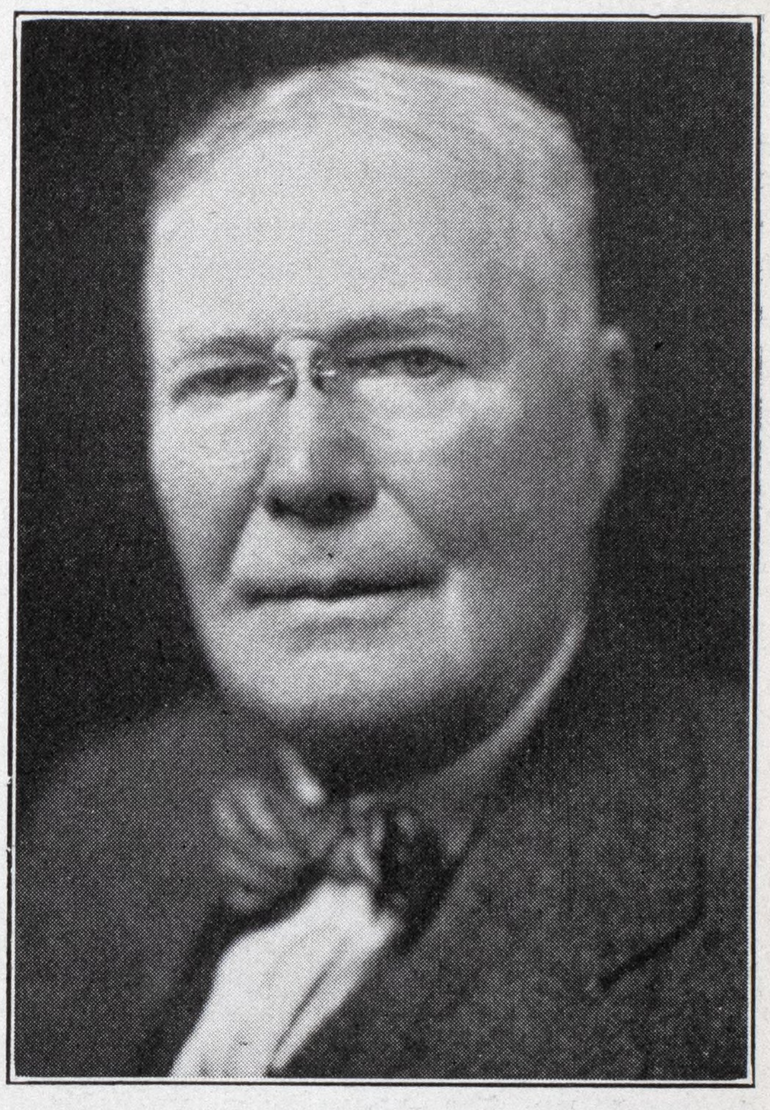
The annual meeting was called to order by J. S. Ashley, president, with over 90 per cent of the voting stock in attendance. Directors and officers were re-elected with but slight changes, the list appearing elsewhere in this article. One important change, however, was made. Mr. Ashley, who has been president since the death of William Livingstone in 1925, asked to be relieved from the arduous duties of this office. A. E. R. Schneider, manager of the Cleveland-Cliffs fleet, expressed the wish of the members present that Mr. Ashley continue in office and proposed a resolution amending the bylaws so that much of the active work in the conduct of the association might be carried on by an executive committee and that a new officer to head that committee be elected chairman of the board. This was approved by the members, and A. F. Harvey, manager of the Pittsburgh Steamship Co., was elected chairman.

L. C. Sabin, vice president of the association reported that the Livingstone memorial lighthouse was practically completed. It was decided that the association as a body would take part in dedication exercises and that arrangement for these exercises might be made for some suitable day in the late summer.

W. H. McGean, manager of the Hutchinson fleet made an interesting report as chairman of the committee appointed to investigate grain carriage and vessel owners' liability in connection with such cargo. He found that the present bill of lading used by lake grain carriers did not include the "due diligence" clause in regard to seaworthiness of the vessel. He pointed out that the present bill of lading in effect gave a warrant that the ship in question was seaworthy in fact. All any shipowner could reasonably be expected to do, would be to exercise due diligence in determining that his vessel was in seaworthy condition. It seems that the Supreme Court has ruled that such a clause is not contrary to public interest. The shippers will be as fully protected as before and several of the leading underwriters have indicated that they have no objection to the inclusion of such a clause. It is therefore expected, that in the future, owners of vessels carrying grain will demand this type of bill of lading from the grain broker.

Capt. R. W. England reported that the shore captains' committee did not have a single instance to report of infraction of the rules laid down for the safe operation of the ships of the association.

George M. Steinbrenner, chairman of the welfare plan committee, stated that the plan continued to function to the best interests of men and owners. He stressed the advisability of an active campaign to reduce the dangers of social illnesses among the men on board ship. This plan is to be carried out in co-operation with the United States health service to the extent of furnishing placards, in-



J. S. ASHLEY
Re-elected President, Lake Carriers

formation and prophylactics. Something like 31 per cent of lost time, from illness and accident, is due to this evil and attention is now being definitely directed toward its reduction.

Protective Association

IN THE afternoon, members of the Great Lakes Protective association met to consider the report of the advisory committee for the year 1929, the twenty-first year since the formation of the association. J. S. Ashley, as chairman, presided, assisted by George A. Marr, secretary. Had it not been for the gale of Oct. 22-23, which caused considerable loss, the season losses would have been less

than normal. In this gale, nine vessels were severely strained, five on Lake Superior, two on Lake Michigan, and two on Lake Erie, including the loss of the WILLIAM B. PILKEY. No less than 31.9 per cent of all the losses during the season was due to this gale. Altogether there were 137 losses reported for the year. It is interesting to note how most of these losses were distributed with references to type of accident. Seventeen or 10.97 per cent were due to striking obstructions in harbors, lakes and channels; 50 cases of striking docks, piers and other fixed objects amounted to 21.28 per cent; 14 groundings in various harbors, rivers and channels when the vessels did not stop, accounted for 13.21 per cent; and there were 29 collisions in harbors with other vessels amounting to 5.27 per cent.

On the whole, however, the chairman anticipates an excess contribution for 1929, after all losses have been adjusted, of $49,896.67 the actual amount, of course, is subject to some fluctuation, either up or down, when all cases have been finally adjusted. The financial statement shows that the account for the year 1923 has been closed and that $56,270.36 was returned to subscribers. The account for the year 1924 has also been settled and subscribers received a return of $7980.77. Though not completely closed, quite definite estimates indicate the following sums returnable to subscribers: For the year 1925, $163,314.33; 1926 account, $43,788.07; 1927 account, $62,533.42; and 1928 account, $76,049.56.

During the first four years of the association only 5 per cent of the various members' total valuation was reserved by the association. This was increased to 25 per cent for the following 16 years, and in the year 1929 to 50 per cent, conventional insurance making up the remaining valuation.

The advisory committee was re-elected without change: J. S. Ashley, chairman, A. E. Cornelius, R. W. England, A. F. Harvey, C. L. Hutchinson, J. T. Kelly, F. I. Kennedy, H. K. Oakes, C. J. Peck, A. E. R. Schneider, George M. Steinbrenner and R. B. Wallace. Officers were also re-elected: J. S. Ashley, chairman; George A. Marr, secretary; R. W. England, treasurer; J. A. Armstrong, assistant treasurer, and Robert G. McCreary, counsel.

A most interesting discussion developed following the suggestion proposed by Capt. R. W. England, manager of the Interstate Steamship Co. that the association consider appointing a committee, the members of which should have practical sea-going experience, to investigate accidents in which vessel property is damaged. It was thought that the investigation of the causes for accidents would not only help to reduce accidents by greater care on the part of the ships' officers but also that much might be learned which will be helpful in preventing accidents through greater knowledge, thus taking advantage of untoward experiences in avoiding them in the future. A lively discussion followed and it was fairly unanimously agreed that such a committee would have a directly beneficial effect. It was also generally agreed, however, that the method of functioning should be carefully studied. Also that individual managers would give serious consideration to recommendations of such a committee with reference to any disciplinary action which might be necessary against the officers responsible. It was made clear that such a committee would just as much tend to safeguard the rights and interests of the master and officers as those of the manager and owner. The advisory committee on the basis of this discussion will study plans for the formation of such a committee.

That lake vessel owners who carry grain should guard against issuing through bills of lading was pointed out by W. H. McGean. Canadian vessel owners have been informed through the committee of which Mr. McGean is chairman that American owners on the Great Lakes cannot under any circumstances agree to assume liability for a shipment of grain to its ultimate destination. Their liability must end at the point of termination of the voyage and they cannot be responsible in any manner for the remainder of the carriage of such grain either to Montreal or to any American port.

Officers

Lake Carriers' Association

Chairman of Board
A. F. HARVEY

President
J. S. ASHLEY

Vice President
L. C. SABIN

Vice President
Secretary and Treasurer
GEORGE A. MARR

General Counsel
NEWTON D. BAKER

Executive Committee

J. S. Ashley, John J. Boland, C. C. Canfield, J. C. Evans, A. F. Harvey, C. L. Hutchinson, H. K. Oakes, A. E. R. Schneider, G. A. Tomlinson, H. S. Wilkinson, Joseph S. Wood.

Alternates

J. Burton Ayers, A. E. Cornelius, H. G. Dalton, A. H. Ferbert, John T. Kelly, James McAlpine, W. H. McGean, W. P. Schaufele, W. G. Stewart, A. C. Sullivan.

Directors
Cleveland

J. S. Ashley, J. Burton Ayers, Newton D. Baker, S. B. Cady, C. C. Canfield, H. D. Dalton, R. W. England, A. H. Ferbert, A. F. Harvey, C. L. Hutchinson, Chas. O. Jenkins, Warren C. Jones, John T. Kelly, Geo. S. Kendrick, F. I. Kennedy, Geo. A. Marr, Walton H. McGean, H. K. Oakes, R. J. Paisley, C. J. Peck, L. C. Sabin, W. P. Schaufele, A. E. R. Schneider, Geo. M. Steinbrenner, W. G. Stewart, H. C. Strom, Baird Tewksbury, G. A. Tomlinson, R. B. Wallace, Geo. H. Warner, Joseph S. Wood.

From Other Cities

J. J. Boland, A. E. Cornelius, J. C. Evans and J. E. McAlpine of Buffalo; H. F. Hughes and A. C. Sullivan of Chicago; J. G. Munson of Rogers City; W. P. Snyder, Jr. of Pittsburgh and H. S. Wilkinson of New York.

Hold Annual Banquet

THE annual banquet of the Lake Carriers association was held at the Hotel Cleveland on the evening of April 17. J. S. Ashley, president of the association, presided and Newton D. Baker, general counsel, acted as toastmaster. A large number of guests were present, including T. V. O'Connor, chairman of the United States shipping board and Dickerson N. Hoover, supervising inspector general of the Steamboat inspection service. In his opening address Mr. Baker mentioned the successful termination of the suit against Chicago for abstraction of water from Iake Michigan, the United States Supreme Court having rendered its final decision in favor of the rights and contentions of the lake states and the Lake Carriers association. Chicago must from now on take steps to gradually reduce the rate of diversion so that in eight years from now, not over 1500 cubic feet per second will be taken in this manner, this including the amount necessary for navigation.

Amendment of the seamen's act to include lake vessels in the category of ocean vessels for signing on and discharging seamen before a United States commissioner has been opposed by the Lake carriers as a burden and delay to their business which is entirely unnecessary and uncalled for under the conditions which exist on the lakes. Though this matter is not yet settled, Mr. Baker felt confident that careful consideration would be given to the facts brought out by the Lake carriers' protest.

Mr. O'Connor delivered a brief review of what the shipping board has accomplished in the six years of his leadership as chairman. A process of liquidation has been going on in which a large number of lines have been sold to private operators and several hundred ships have been scrapped. He promised that this process would continue. The seventeen

remaining lines operated by the government will be turned over to private operators as speedily as possible. In the meantime he pointed out that contracts for something like 64 new ocean going vessels were in hand and that very shortly every berth in coast shipyards would be filled. He said that no legislation before in American history has been as effective in a beneficial way as the merchant marine act of 1928, known as the Jones-White law. This great program of new shipbuilding has become possible due to its wise provisions of mail pay and loaning funds for building at a low rate of interest. Two super liners, each to cost $30,000,000 will be laid down in American shipyards as soon as the necessary plans and arrangements are completed. He paid a fine tribute to the late leaders of the association, Livingstone, Goulder and Coulby and said that no matter how much they may have disagreed at times, when he was representing the interests of labor on the Great Lakes, they continued friends to the end.

A few brief but most interesting statistics were brought out in the address by Dickerson N. Hoover, showing the great safety of traveling by water. The general stated that his office had recently been engaged in an attempt to evaluate the existing merchant marine of the United States. Its value was found to be $2,151,999,651.44. Some reasonable doubt might be expressed as to the ultimate accuracy of this figure to the extent of the last $1.44. But here is a definite figure carefully arrived at which shows the tremendous property value over which the steamboat inspection service exercises considerable detailed supervision. All this is done by an exceedingly small staff.

Safety of Travel by Water

Mr. Hoover pointed out that investigation shows, over a period of ten years, only one passenger has been lost for every 5,000,000 carried on vessels. The record of the railroads is the loss of one passenger for every 201,000 carried, and for airplane travel one passenger lost for every 2400 carried. This shows the remarkable degree of safety with present equipment and supervision in traveling by water. Consequently, though the steamboat inspection service intends to continue to use every effort to still further increase safety, both for life and property, that there is little excuse for the adoption of extremist measures which are likely to prove burdensome to the shipowner and without proportionate results.

Development of Mobile

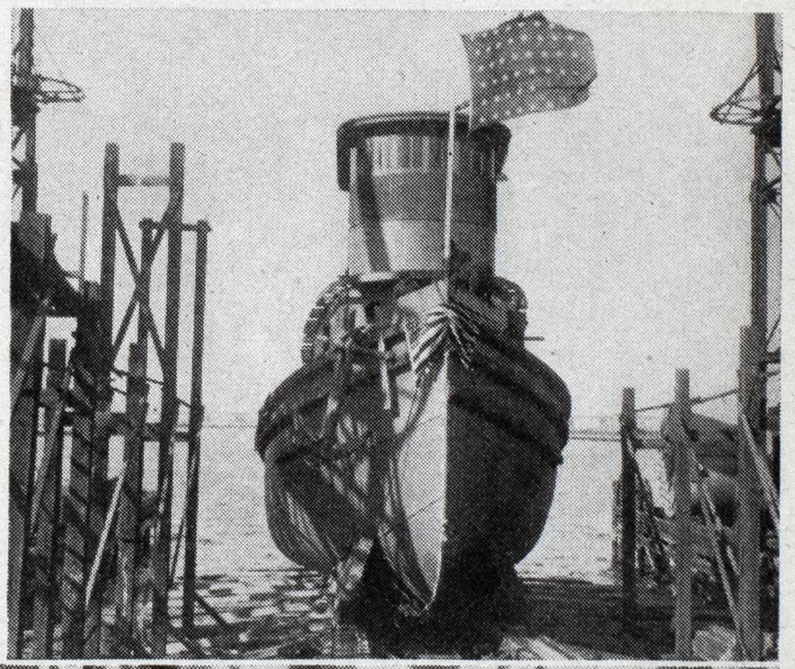
Few ports in the United States can show more substantial development in recent years than the port of Mobile, Ala., according to a report recently issued by the bureau of operations of the shipping board and the board of engineers for rivers and harbors of the war department. This report is a revision of the data on the port of Mobile originally issued in 1922 and is known as Port Series Report No. 3, Part 1. Copies are available from the superintendent of documents, government printing office, Washington, for 50 cents.

The volume contains information on port and harbor conditions regulations, services and charges; fuel and supplies; facilities available including piers, wharves, ship repair plants, dry docks and marine railways, coal and oil bunkering facilities, grain elevators, storage warehouses, bulk freight accommodation, floating equipment, and wrecking and salvage equipment; railroad and steamship lines.

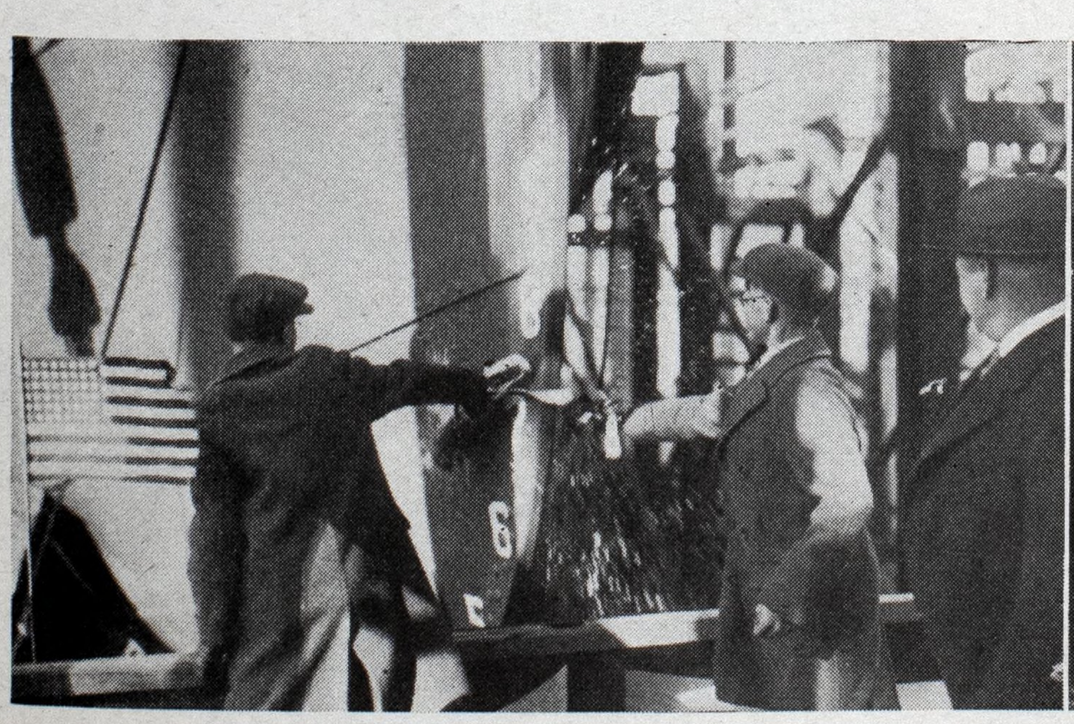
There has been a substantial increase in the amount of tonnage handled annually at Mobile, its total waterborne commerce having increased from 1,970,638 tons in 1919 to 3,997,660 tons in 1928, a gain of over 100 per cent.

Launch Two Baltimore & Ohio Harbor Tugs

TWO new harbor tugs, the DEVOE AND HAROLD and the WILLIAM J. DICKEY, building for the Baltimore & Ohio railroad, were recently launched at the Staten Island plant, New York, of the United Dry Docks Inc. The first tug, shown at the right, as she enters the water was christened (below) by the two grandsons of Daniel Willard, president of the road, after whom she was named. The second tug (below and to the right) was christened the WILLIAM J. DICKEY for and by the young grandson of C. W. Galloway, operating vice president of the Baltimore & Ohio.



THESE tugs are 118 feet 6 inches long, 25 feet in beam and 13 feet 6 inches deep and are powered by vertical compound steam engines. They are the seven hundred and ninety-third and seven hundred and ninety-fourth hulls launched at the Staten Island plant.



Circulation in Scotch Boilers

System of Thermo-Syphonic Circulators Tried Out in Scotch Marine Boiler—Steam Raised in Three Hours—Heat Equalized

By C. A. Seley

THE first application and test of an interior built circulator for scotch marine boilers, designed by the writer, were made Nov. 14, 1929, on one of the four, three-furnace, single ended boilers of the carferry ANN ARBOR No. 7, plying between Frankfort, Mich., and Wisconsin ports.* This carferry is 348 feet long, 66-foot beam and has twin propellers driven by triple expansion engines. The boilers are 14 feet 6 inches in diameter by 11 feet long. Both hull and machinery were built by the Manitowoc Shipbuilding Corp. in 1925.

In making the circulator designs only the boiler drawings were used. Wooden templates were made of the vertical plates to insure their fit between the chambers. Bottom extensions were completely assembled at the shop with all pieces marked for assembly in the boiler. The installation took about six working hours for each of the two circulators, all connections being bolted, no riveting or welding being necessary. A cutting torch for trimming was used to advantage.

Before installing the circulators the boiler was tested out as usually fired and operated to ascertain interior temperatures under these conditions. To get simultaneous records of temperature as affected by circulation and other conditions a two pen Bristol recording thermometer was used. A thermometer bulb for the upper water was located between combustion chambers, about a foot below the average water line, and for the lower water at about four inches above the inside bottom of the shell and a foot from the vertical center line.

An examination by hand of the boilers under operation at the time showed that all had hot bottoms. Hotwell water at 140 degrees Fahr. was passed through a Reilly heater raising the temperature to 210 degrees. This water then passed through the boiler and through the steam space for about eight feet from the back head to a cross pipe leading to both sides, with down pipes between the shell and outer flue section, the outlets being well down below the grate line. The feed water, heated to an unknown degree by this system, was ejected downward through the bottom water. The bottom thermometer gave a wavering record, at times reaching the top temperature and falling as much as 90 degrees, the resulting temperature being about that of steam at 43 pounds pressure, while that of the top line represented about full boiler pressure, close to 185 pounds.

The bottom line variation did not always coincide with the working or layover periods, but to pump operation, whether running or laying over. These varying temperatures indicated clearly a lack of a cycle of circulation. Such a condition is detrimental and contributes to the expense of maintenance, not so much perhaps by

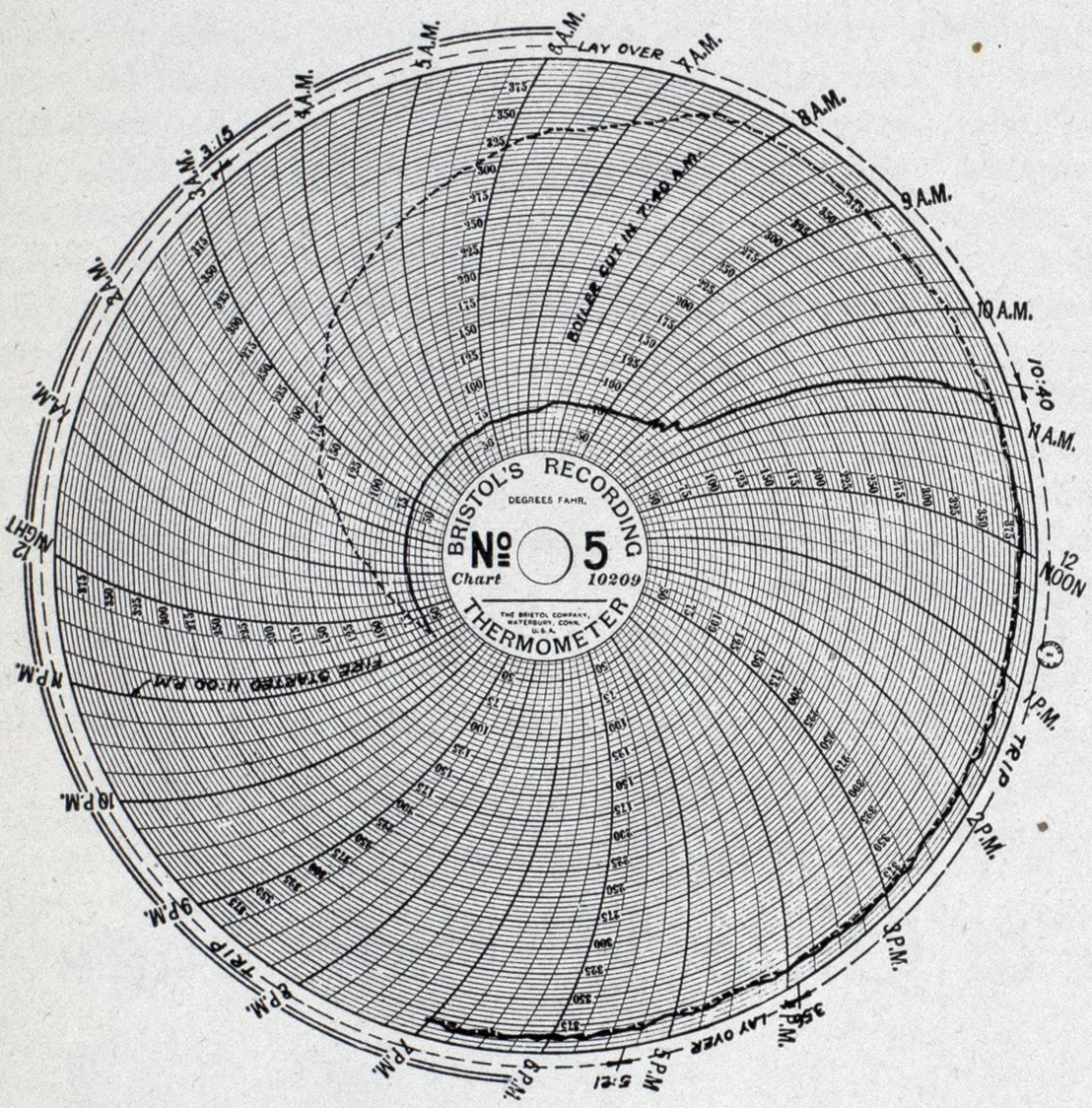
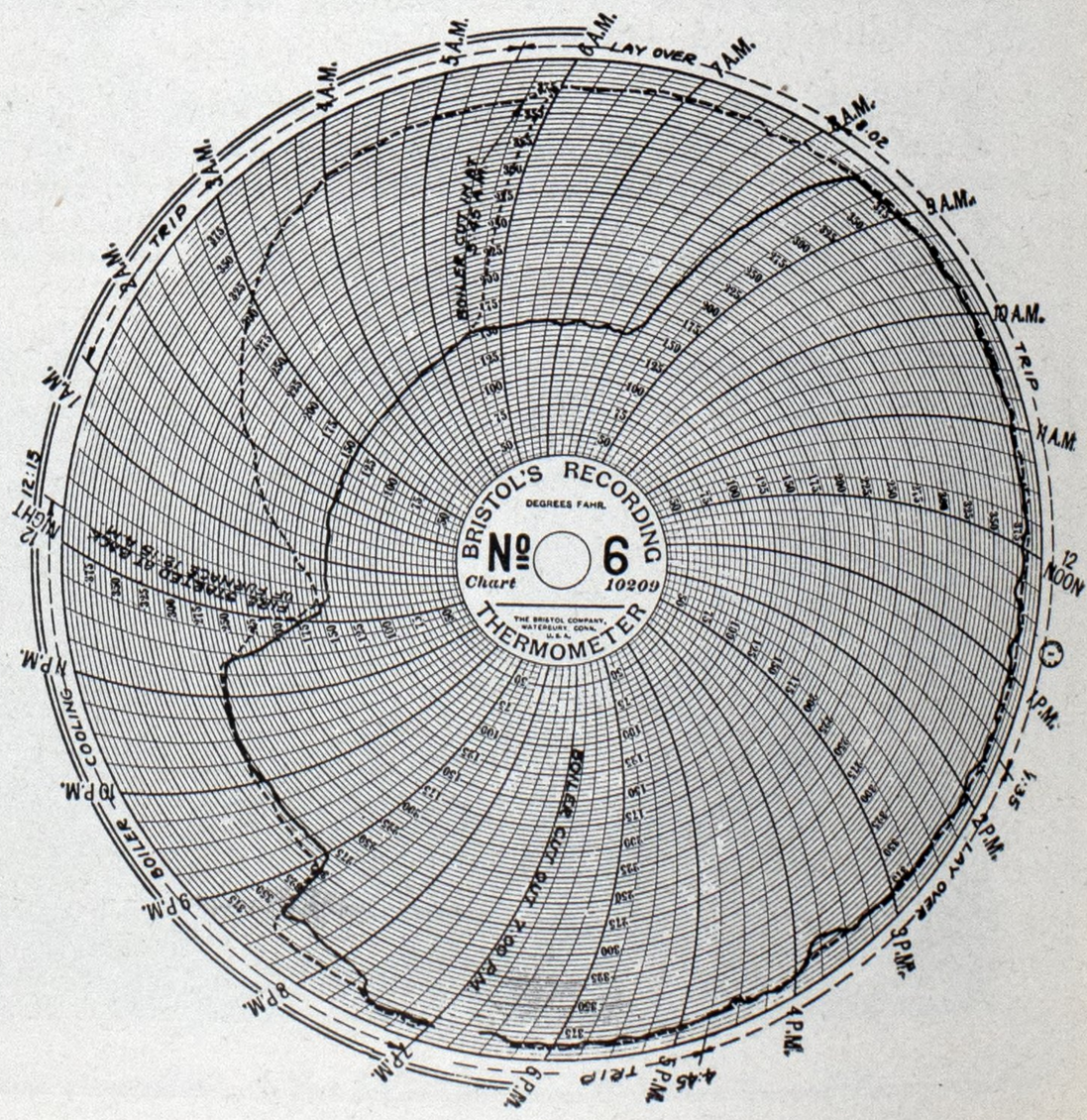


Chart No. 5 Shows the Result of the First Test with Circulators Installed—Steam Raised from 60° Fahr. Water in 8.5 Hours.

In Chart No. 6 Are Shown Results of the Second Test with Circulators Installed—Steam Raised to 120 Pounds Pressure or 350 Degrees Fahr. in 4 Hours.



This article is an abstract of a paper read by the author, C. A. Seley, consulting engineer, Locomotive Firebox Co., Chicago, before the annual conference of supervising inspectors of the United States Steamship Inspection Service at Washington, D. C., Jan. 21, 1930.

*Following these tests and three and one-half months operation and several internal examinations of the boiler, the circulators were approved and the remaining three boilers were similarly equipped.

the range covered as by the alternating stresses set up in the boiler structure. In any case, it was evident that a complete cycle of circulation is not set up covering firing up and operation. Maintenance of these pipes is high as they fill with incrustation which is difficult to remove.

To test the circulators it was necessary to disconnect the down pipes, thus discharging the water at the top. A subsequent test showed no rising tendency of the bottom water temperature until some fourteen hours later it rose to the top when in operation but dropped off somewhat during layovers. This was explained by the heating surface influence of the combustion chamber bottom of the center furnace of a coal burning boiler. Prior to making the tests the boiler was washed and the combustion chambers were cleaned. The lower surfaces of combustion chambers become ineffective in heat transfer during a considerable portion of the time, due to filling up with ashes and unburnt coal falling over the bridge wall. These tests occurred at a clean period with maximum heat transfer. This surface ran down to about the level of the bottom thermometer, and would only be effective when clean, and then only when in operation with fire unchecked. This and the relatively small are of the heating surface would account for the length of time it took to affect the bottom water temperature and the loss during layovers. Three furnace boilers have a slight advantage in this respect over boilers with two or four furnaces.

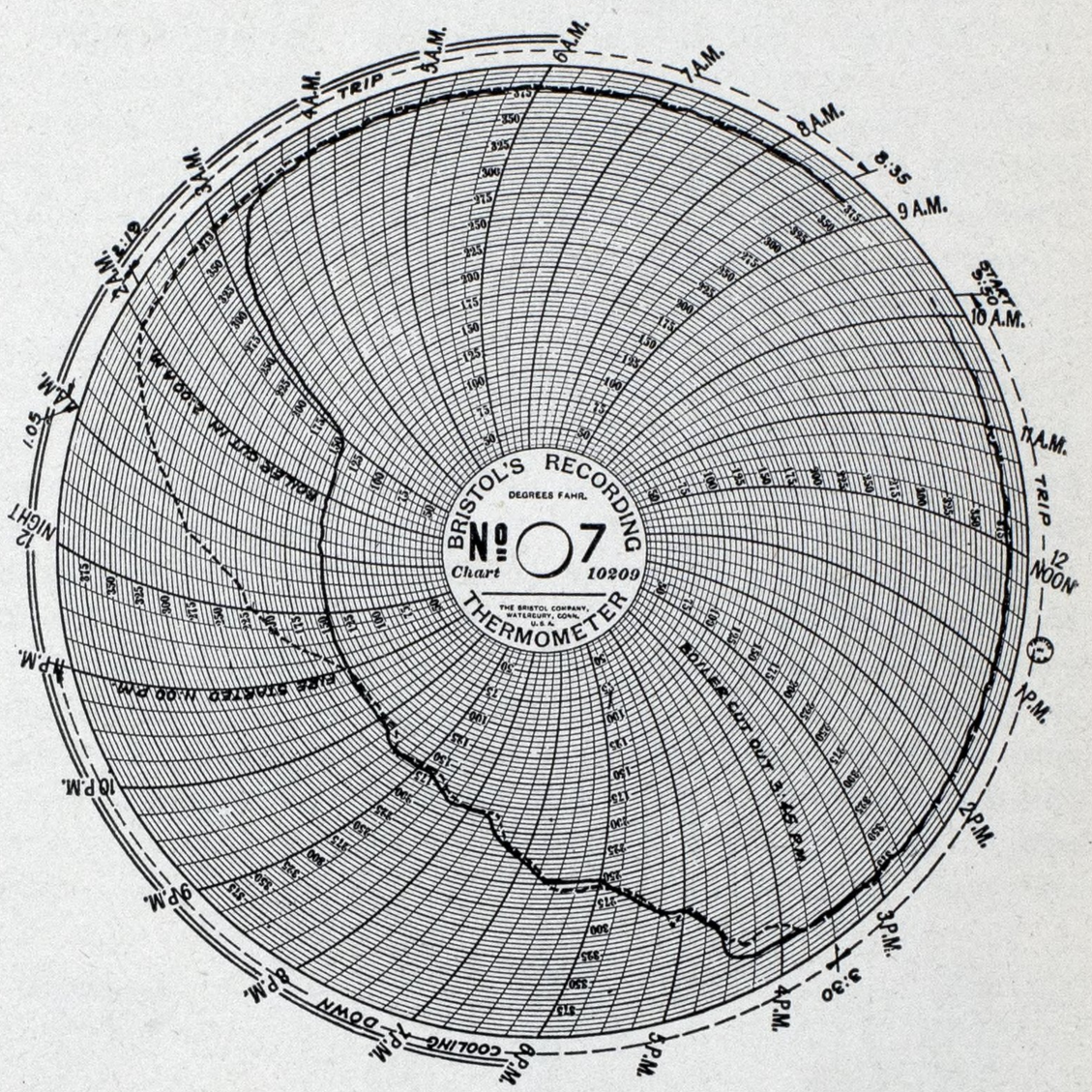
Then followed cooling down of the boiler and the installation of the circulators. The first test was from cold water and fired up at a slow rate with fires only at outer ends of the grates, as is common practice. With no fires at the back ends of the grates and with hollow bridge walls the gases passing to the combustion chambers were low in temperature, so that raising steam was a slow process as shown in the accompanying illustration, chart No. 5. It was accomplished and the boiler was cut in during a layover in about eight and one half hours.

Bottom temperature had risen five degrees in eight hours, and in three hours more of layover to 100 degrees, by which time the fires had been spread, operation resumed and the circulation uncovered the bottom thermometer, raising its temperature to that of the top line, remaining at that point throughout the balance of the test, or about eight hours. The chart will show that steam was raised from 60 degrees water in eight and one half hours, which had been somewhat prolonged by long layover. Full circulation had been delayed three hours more, although close to the bottom, as fires were not spread, and the combustion chambers, from which the circulators gain their heat transfer necessary to active production of circulation were supplied with a minimum of heat.

Location of the bottom thermometer bulb and its action on this and following charts should be clearly understood. It was purposely located as low as feasible taking possible sludge conditions into consideration and getting bottom water temperatures. The bottom sheet of the circulators were two inches or more above the level of the thermometer so that, measuring from the center of the circulator opening, down to the uncovered bulb, was a depth of perhaps five or six inches of water below the direct influence of the circulator to pick up after full circulation had been set up to the depth of the circulator. Progress downward of the general circulation could be observed by bare hand tests on the unlagged lower portion of the back head and its approach to the thermometer was known in advance. Slight steam leaks showing with the colder water dried up as the circulation became complete, but it was not evidenced by the lower thermometer bulk as long as the colder water was blanketing it.

For the next test the firing was

(*Continued on Page* 62)



When Tests Were Resumed the Results Were as Shown in Chart No. 7—Steam Was Raised and Boiler Cut in, in Exactly 3 Hours from Cold Condition.

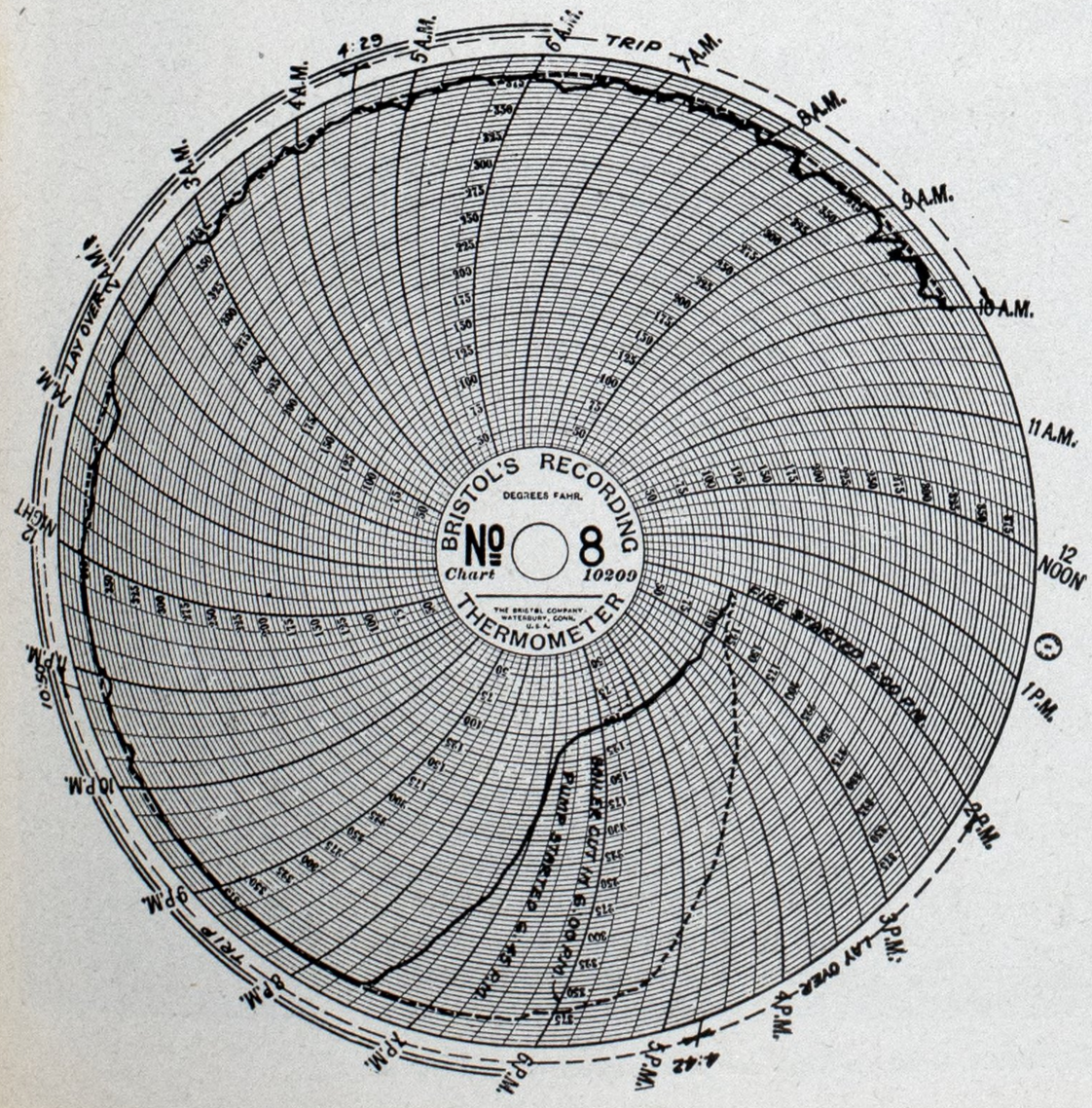


Chart No. 8 Shows the Results of Fourth Test, obtained with Down Feed Pipes Again Connected in Comparison with Previous Records.

Launch Canadian Passenger Ship

New Ship for Pacific Coast to Alaska Trade Has Single Reduction Geared Turbine Drive—Enters Service This Summer

WITH the launching, at Birkenhead, in January, by Miss Ishbel Macdonald, daughter of the Prime Minister of Great Brittin, of the PRINCE HENRY, followed a month later by the launching of the PRINCE DAVID, the Canadian National Steamships took steps to cope with the ever growing tourist traffic along the Pacific and to Alaska. These two new steamers will be in service this coming summer and a third, the PRINCE ROBERT, will follow later. In addition to improving its service from Vancouver to the ports of Alaska, the Canadian National Steamship system will add a service between Vancouver, Victoria and Seattle.

The new steamers are the work of Messrs. Cammell-Laird and Company, Ltd., of Birkenhead, who built the five handsome ships now operating between Eastern Canada and the British West Indies. They are according to plans and specifications prepared by A. T. Wall and Company, of Liverpool, who also prepared the plans and supervised the building and fitting out of the steamers now in the West Indies trade.

While in outward appearance resembling the steamships PRINCE GEORGE and PRINCE RUPERT, now engaged in the British Columbia service, the new steamers, PRINCE DAVID, PRINCE HENRY and PRINCE ROBERT, are of greater length, wider beam and draught, being 384 feet overall, as compared with 306 feet of the present vessels. The new steamers have straight stem cruiser stern, three funnels, and two steel masts. Accommodation is provided for 334 first class and 70 third class passengers in rooms and cabins; while 1500 passengers may be carried on the deck space for short runs, as, for instance, between Vancouver and Victoria.

The public rooms are spacious and handsomely decorated, a special feature being a large observation room on the promenade deck with generous window space to ensure the widest possible view.

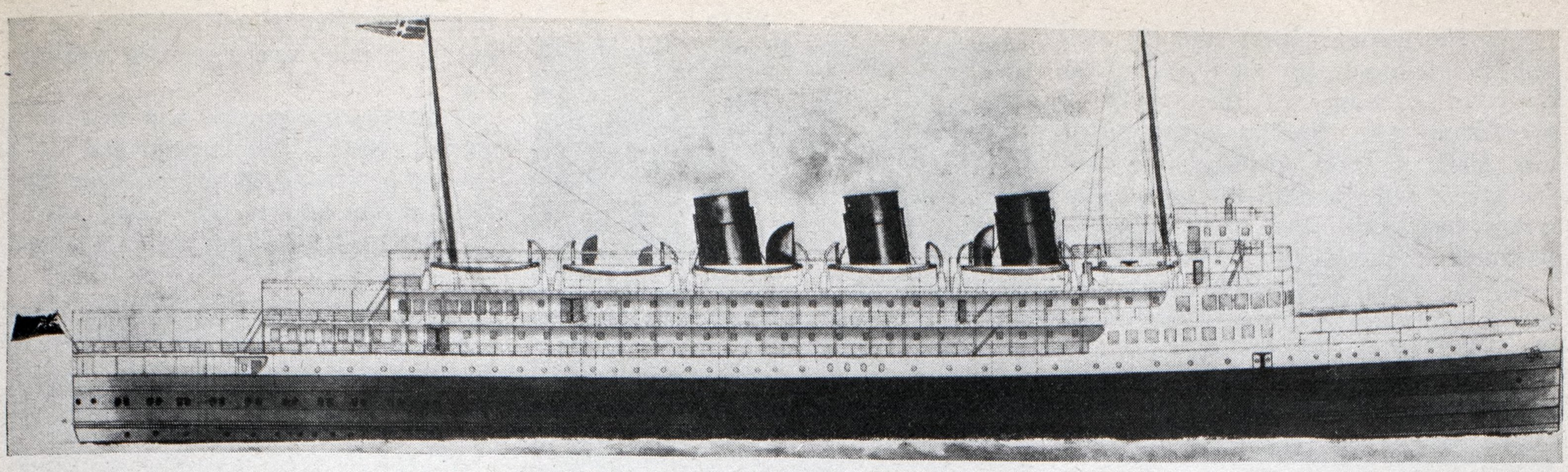
The cabin equipment goes rather beyond the usual design, as it includes a telephone in each room. This is in addition to the private, inter-communicating telephone system which enables the captain and the chief engineer to keep in touch with other officers. The telephones in the cabins are connected to a private branch, using the dial system. The central telephone exchange is so arranged that it may be connected with land on arrival at any port. The vessels are equipped for the reception of radio broadcasting and the transmission of music from an orthophonic instrument for the entertainment of passengers in the dancing space, lounges, and other public rooms.

For the comfort of the passengers, a great deal of care has been expended in designing adequate steam heating and ventilation and in providing for the greatest possible amount of daylight on shipboard.

The artificial lighting has been planned to afford illumination sufficient and without glare. Other matters which add to the comfort of the passengers even if they do not fall under their personal observation, are the well equipped kitchens and the cold and dry storage facilities for the care of food.

The new vessels each provide at

Launching of the Prince Henry of the Canadian National Steamships at Birkenhead, England



Artist's Drawing of New Vessels Building for Canadian National Steamships

least 45,000 cubic feet of ordinary cargo space, bale measurement, and about 4370 cubic feet net of insulated cargo space. There is a place also for the carriage of motor cars, mail and baggage. Special attention is paid to the carriage of passengers' automobiles, and an electric hoist is used to convey cars to the proper storage space. All cargo winches are silent running.

Canadian woods have been used as far as possible for the timber requirements of the ships, including British Columbia Douglas fir and white elm.

Fulfilling the requirements of the British board of trade and the Canadian maritime authorities, all measures have been taken with regard to safety at sea and the provision of adequate protection against fire.

The propelling machinery consists of two sets of Parsons single reduction geared, impulse reaction turbines of the latest improved type. Each set consists of one high pressure, one intermediate, and one low pressure ahead turbine geared to the main shaft through double helical pinions and gearwheel. Astern turbines are incorporated in the intermediate and low pressure turbines and develop about 65 per cent of the total ahead power. The turbine revolutions at full power are 250 per minute. The total power developed is sufficient to give the vessel a service speed of 22¼ knots. In order to obtain this speed economically, special attention was given to the underwater form of the vessels. Extensive experiments were carried out at the National Physical Laboratories, Teddington, End. Particular attention was given to the shape and type of propeller and experiments were carried out with different types of built and solid propellers. The installation is designed to obtain a maximum efficiency and economy, and is up to date in all respects.

Steam for main machinery and its auxiliaries is generated by six Yarrow watertube boilers, the latest 5-drum type, having a working pressure of 350 pounds per square inch. The steam is superheated about 170 degrees Fahr. making the total temperature about 605 degrees Fahr. The boilers are oil fired on the Wallsend-Howden system of forced draught, three Duplex oil burning plants being provided. Triple flow air heaters are fitted in the smoke boxes through which six double inlet high efficiency Howden forced draught fans supply the air to the burners. One fan supplies each individual boiler.

Two cylindrical boilers generate steam at 200 pounds per square inch, pressure for the low pressure auxiliaries, such as oil fuel unit, forced draught fan engines, forced lubrication pumps, oil fuel plant, galley and ship's steam heating, etc. They also supply the makeup feed for the water tube boilers, the steam first entering the turbines at a suitable stage before being condensed in the main condenser. These boilers are also oil fired with forced draught. One fan with two engines supplies the necessary air for combustion.

Two Weir's regenerative main condensers deal with the total condensate from the turbines. Each condenser is circulated by a turbo-driven circulating pump. The condensate is drawn from the main condensers by two motor driven extraction pumps, which discharge through ejector condensers and drain coolers to the feed pumps. Turbo driven main feed pumps draw from the circuit and discharge through primary and secondary feed heaters to the water tube boilers, the final feed water temperature being 300 degrees Fahr. The whole of the feed system is on a closed feed circuit. Weir's feed water regulators are fitted at the water tube boilers for regulating the water level and these are automatic in action.

Distant reading water gages as well as ordinary are fitted for ascertaining the water level in the boilers. Low water level controls are also fitted; these operate in conjunction with the oil fuel pressure system, the oil supply being automatically cut off when the water reaches this pre-determined low level in the boilers. Steam to the main machinery is controlled by speed governors, one on each turbine shaft. These governors also operate in conjunction with the

Party at Launching of Prince Henry. Miss Ishbel MacDonald, Daughter of the Prime Minister of Great Britain, Acted as Sponsor

forced lubrication supply and the system is automatically shut off in the event of a failure of the supply of lubricating oil. Special provision is also made in these governors so that the steam will be shut off should the thrust pads fail, thus preventing the stripping of the blading in the turbine.

All the auxiliaries in the machinery spaces except those already mentioned are motor driven.

The ventilation of the machinery spaces has had special consideration, supply fans by the Windsor Engineering Co. are fitted in engine room ventilators. Large ventilators supply the boiler room with combustion air for the boilers and also assist the ventilation of these spaces. Special attention is given to boiler and turbine casings and pipe coverings to reduce radiation losses.

Three 175 kilowatt turbo driven electric generating sets by Sunderland Forge, Belliss & Morcom supply the total electrical equipment throughout the vessel, one set being provided as a standby. One Gardner 18 kilowatt Paraffin driven generating set is also provided for emergency lighting, etc.

A complete electric driven CO_2 refrigerating plant by J. & E. Hall is installed for dealing with the provision

Capt. H. E. Hedden is to Bring the Prince David, Another Vessel of the Canadian National Steamships, to the Pacific Coast After Completion in England

rooms of the vessel, also the small refrigerated cargo spaces.

The electric motors are being supplied by Messrs. Laurence Scott and Electromotors Ltd., and the electrical installation complete is being carried out by Sunderland Forge & Engineering Co. Ltd.

The steering engine and gear is by Brown Bros., Edinburgh, and is of the tiller type with rod control. Electric driven capstan and boat winches are being supplied by John H. Wilson of Seacombe.

The winches are single geared silent running type by Babcock & Wilcox Ltd. They are the owner's special pattern and are totally enclosed with automatic oil lubrication.

The addition of the PRINCE HENRY, first of the three to be launched, will greatly augment the summer Alaska service from Vancouver. The Alaska schedule will begin on June 9, when the PRINCE GEORGE sails north. The PRINCE HENRY will sail from Vancouver for the first time on July 3. During the 1930 season, which ends Sept. 3, with the arrival of the PRINCE RUPERT at the home port from Skagway, there will be 20 sailings, seven more than took place last year. The service which links Vancouver with Alaska by the inside passage and the ports of Prince Rupert, Ketchikan, Juneau, Wrangell and Skagway, has become increasingly popular every passing summer.

Portland to Celebrate Marine Day

THE city of Portland, Ore., will celebrate its second annual Marine Day on June 28. The event is sponsored by the Portland Shipping club and the object of the celebration is to influence Portlanders to visit the waterfront and inspect terminals and ships, elevators, loading machinery, etc., in order to gain a better knowledge of the part played by shipping in the life of their community. A large committee composed of men from all branches of water transportation has been assembled by Stanley Semple, prominent shipping executive, who has been appointed chairman of the Marine Day committee. All shipping companies will be urged to observe open house on their ships and docks and an extended program of water sports and social events is being planned. An interesting account of Portland's marine activity is contained in the following statements.

Sixty separate shipping lines make Portland a regular port of call for their vessels. This number does not include oil companies operating tankers, local river craft lines or fishing companies operating seagoing craft. Since January 1929, nine shipping lines have been added to those already serving Portland, besides numerous new extensions of service among the old lines serving Portland.

A total of 1929 ocean vessels arrived at Portland in the year 1929, an average of 5 or 6 ship arrivals per day. From 15 to 20 deepwater ships are loading or unloading in the harbor daily. About as many more load daily at lower river points outside the harbor limits. A total of 5,344,273 short tons of cargo was handled by ocean vessels in 1929. In addition the local or inland river tonnage was at least 4,000,000 tons

United States shipping board tonnage reports placed Portland thirteenth among ports of the United States and third port in size on the Pacific Coast last year. More lumber is shipped from Portland than from any other port in the world and Portland frequently stands first in wheat shipments among the nation's ports. More wool is shipped from Portland to the Atlantic coast than from any other port on the Pacific Coast.

Total ocean tonnage of the port in 1910 was 1,802,000; in 1915 it had advanced to 2,028,435. The 1929 tonnage was 3,315,838 tons greater than in 1915 an advance of 164 per cent in 14 years. Foreign tonnage has increased 300 per cent in the last 14 year period, amounting to 1,629,000 tons in 1929. Portland is the sixth port in the United States in export tonnage.

Portland was the port of entry for $10,212,000 worth of raw silk in 1929. Copra is the largest single item of import, 41,850 tons arriving in 1929.

See More Shipbuilding

Kenneth D. Dawson, operating the States Steamship Co., Portland, Oreg. on April 22 presented a request to the interdepartmental subcommittee on merchant marine for a mail contract to operate between Portland and the Orient. If this contract is granted it will mean the construction in American shipyards of five 16-knot passenger and freight vessels costing approximately $16,500,000. Ships on this proposed route will operate from New York, Baltimore, Havana, through the Panama canal to Los Angeles, San Francisco, Portland and thence to the Orient.

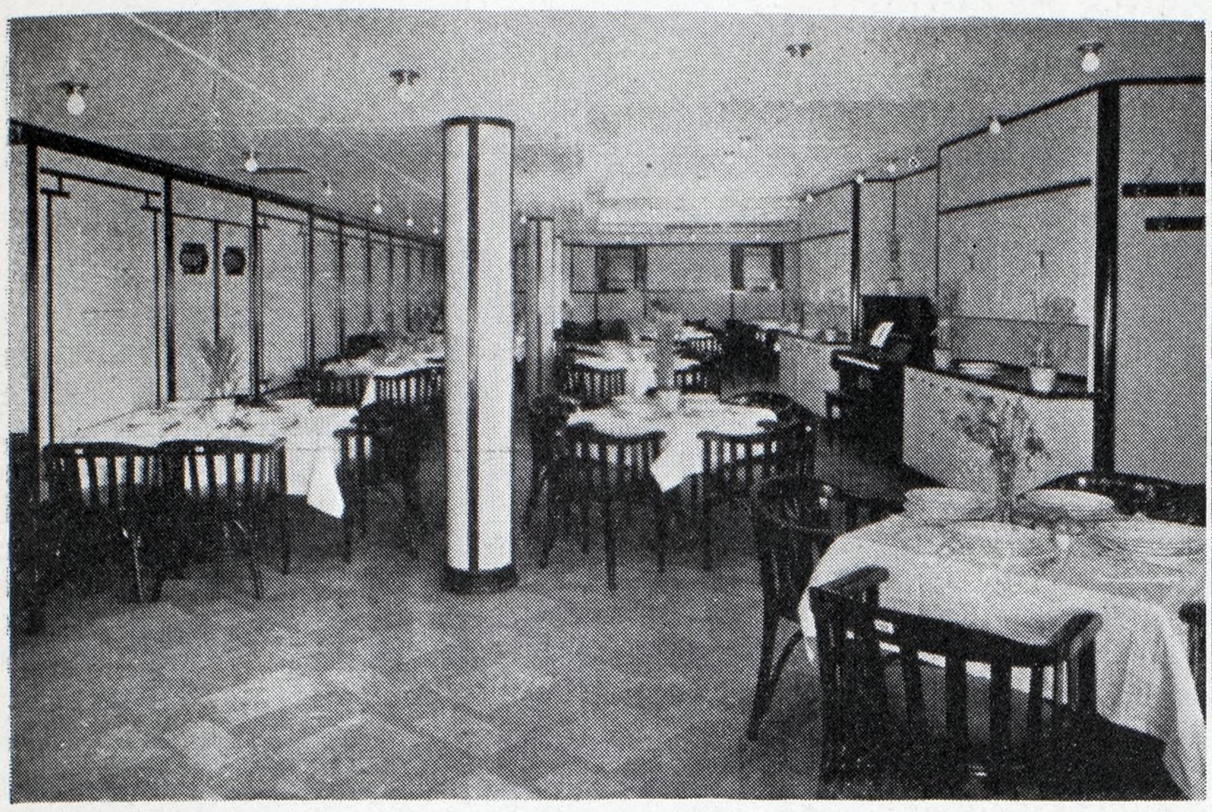
Bids are to be opened on May 12 for three Eastern Steamship vesels of the YARMOUTH type.

Contracts are ready to be placed for six United Fruit boats, three to the Fore River plant of the Bethlehem Shipbuilding Corp. and three to Newport News Shipbuilding & Dry Dock Co.

Interior Views on German Liner Europa

Breaks Transatlantic Speed Record on Maiden Voyage

Dining Room Third Class

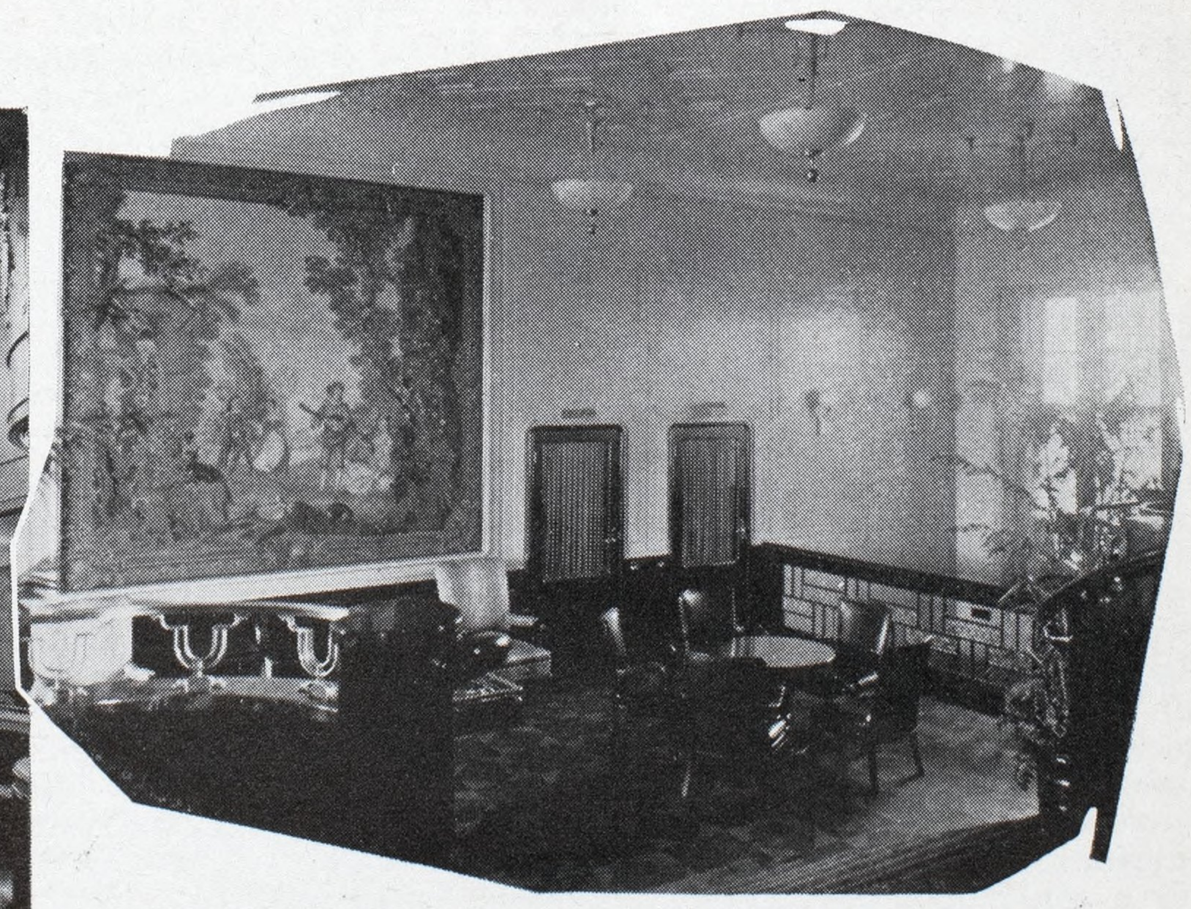


Ladies Rest Room Second Class

Below—The Schurman Room

First Class Lounge

Ballroom



Foyer Entrance to Sun Deck Restaurant

Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review
By Harry Bowne Skillman
Attorney at Law

WHETHER a signal given by a steamship colliding with another steamship constituted a lawful signal depended upon the position of the two ships, it was decided in the case of SABINE SUN, 33 F. (2d) 42. It was also declared that where two steamships when sighting each other and coming within signaling distance were "head and head, that is, head on, or nearly so," it was the duty of each steamship, under pilot rule 4, to pass on the port side of the other, and the duty of the ship first giving the signal, to give it by a single blast for a port to port passing, other wise she would violate the rule and be guilty of the primary fault; if the two steamships when sighting each other were not "head and head" or within the latitude permitted by the definition of that expression but their positions were such that the one was on the starboard bow of the other, the steamship giving the first signal might, under pilot rule 4, signal by two blasts for a starboard to starboard passing.

* * *

A BILL of lading is both a contract and a receipt. A recital that the shipment is in good order and condition is not contractual and does not amount to a warranty as between the immediate parties. The carrier is free to prove the contrary. The recital contained in the bill of lading was therefore only prima facie evidence and was entitled to such consideration as the court deemed proper under the circumstances, and no more. —Amerlux Steel Corp. v. Johnson Line, 33 F. (2d) 70.

* * *

THE rule that barges, when left with barges, are demised, is confined to those which have no motive power of their own.—Hansen v. E. I. Du Pont de Nemours & Co., Inc., 33 F. (2d) 94.

* * *

IN THE case of United States v. Munson Steamship line, 33 F. (2d) 211, it appeared that the steamship company received merchandise from a rail carrier and issued bills of lading to the shipper for the carriage of goods by water and paid the freight rate for transportation of goods by rail at the request of the shipper to the rail carrier on the presentation of the bills for the freight. The question involved was whether the steamship company took part in transportation of the goods with rail carriers under a common arrangement for a continuous carriage or shipment, so as to be subject to the requirement imposed upon all carriers subject thereto by the Interstate Commerce act that they shall file their tariffs with the commission. The court held that the company was not so taking part in transportation. By "common" the court thought must be meant an arrangement between the two kinds of carriers, namely, the rail carrier and the water carrier, not merely an arrangement between the shipper and one of the carriers; and, further, that this mutual arrangement must contemplate some participation by both carriers in a continuous carriage or shipment, which is the subject of the arrangement. Turning to the word "continuous," the court said its use must be predicated upon the assumption that both the rail carrier and the water carrier participate in some way in the entire movement; it does not mean continuous in a physical sense.

* * *

PRIOR to 1851, under the common law, it was pointed out in the case of Kokusai Kisen Kabushiki Kaisha v. Texas Gulf Sulphur Co., 33 F. (2d) 232, the liability of the shipowner for damages to freight caused by a fire on board ship was that of an insurer, and absolute, unless the fire was caused by an act of God or the public enemy; his personal liability was limited only by the amount of the loss and his ability to respond. On March 3, 1851, an act of Congress, afterwards carried into the revised statutes as sections 4282, 4283 et seq., became effective. These sections were designed to modify the common law liability of a shipowner, not only as to losses caused by fire, but also by collision and other accidents. Said the court: "They are in pari materia and must be construed together. They were not intended to, and do not, entirely excuse an owner for loss by fire in every event, even though not caused by his own design or negligence." The shipowner is still liable to the extent of his ship and freight for the negligence and misconduct of his employees and liable without limit for his own negligence.

* * *

WHERE the contract between the parties provides for general average, the provisions of the bill of lading control. In the absence of some provision to the contrary in the bill of lading, said the court in Bowring, Jones & Tidy Ltd., v. Charter Shipping Co., Ltd., 33 F. (2d) 280, the law or custom at the port of destination as to liability for general average prevails.

* * *

IN THE case of ORIZABA, 33, F. (2d) 326, there was disclosed a situation where 50 barrels of tobacco were delivered and the shipping permit receipted and delivered to the shipper, entitling him on its delivery to the carrier to a bill of lading, and before the bill of lading was delivered some of the goods shipped were damaged, but the bill of lading was delivered for the whole shipment and accepted by the shipper, who some time after allowed the carrier to note on the bill the short shipment of 15 barrels. Such indorsement, declared the court, in no way changed the agreement made by the delivery and acceptance of the bill of lading, which must be dated, and is effective as of the date of receipt of the shipment on board the ship.

* * *

A PASSENGER on board a steamship, claiming to have lost by theft from his stateroom a wrist watch and money, has the burden of proof to establish his allegations. Though the steamship posted a notice regarding the necessity of leaving valuables with the purser, where the watch was necessary to the personal convenience of the passenger and was worn by the passenger, the latter had the right to keep the watch in the stateroom as regards liability of the steamship for the theft thereof. In the case at bar, however, it was held that due to negligence of the passenger in tossing the watch on a dresser by an open window, instead of putting it in a dresser drawer, no liability attached to the steamship company.—MUNARGO, 33 F. (2d) 329.

* * *

THOUGH, on certain occasions resort may be had to proof of the circumstances of an occurrence in order to raise an inference of negligence, the mere fact that a towing strap broke, causing the tug and her light tow to come in contact, due to swells produced by passing of a large steamer, is insufficient unless accompanied by proof of some neglect to use due care by the parties charged with the causing the accident.—H HEBERMAN, 33 F.

* * *

CARE in securing barrels in broken stowage so as to prevent their coming adrift under stress of weather was required, where the voyage was one upon which severe and stormy weather was to be anticipated; and in meeting the presumption of fault arising from shipment in good order and delivery in bad, it was said in the case of H. E. Hodgson & Co., Ltd., v. Royal Mail Steam Packet Co., 33 F. (2d) 337, it was the carrier's burden to prove that the cargo was properly stowed, and that damage arose from a cause for which it was not responsible.

Ship as Power Plant

On April 2 the sale of the steamer JACONA was authorized to the New England Public Service Co., Augusta, Me., for $25,000 cash with the understanding that the purchaser will convert her into a floating power plant within a year at the cost of not less than $1,000,000. Machinery and equipment not useful to the ship after conversion are to be scrapped.

As a floating power plant, the vessel will be equipped with two 10,000 kw. steam turbo generators of the oil burning type and four high pressure water tube boilers. The ship will be used for transmitting power to coast cities of Maine and New Hampshire for the benefit of newly established industries where land power facilities are not available. The JACONA is a steel cargo vessel of 7668 deadweight tons. She has been in lay-up for eight years and is one of the vessels assigned to the list for scrapping. The price obtained by the board is $8000 more than the estimated scrap value.

Error Is Corrected

In the table of analysis of power and gross tonnage of vessels on page 22 of the April issue there is an error in the average horsepower of diesel direct drive. It should be, of course, the total horsepower which is noted as 53,014 divided by the number of vessels, 52 or 1020 instead of as incorrectly shown, 2910. This correction also applies to the text on the same page referring to the analysis. In other words the average horsepower of all vessels listed on pages 80, 81 and 82 of the April issue fitted with direct drive diesel machinery should be 1020.

Loan to Dollar Lines

A loan not to exceed $580,000 covering three-fourths of the cost of reconditioning the PRESIDENT FILLMORE and an additional loan not to exceed $420,000 covering three-fourths of the cost of improving the PRESIDENT JOHNSON were awarded the Dollar Steamship Lines, Inc., by the shipping board April 9. The loans will be made under an agreement stipulating repayment in five equal annual installments and will bear interest at the minimum rates provided in the Jones-White merchant marine law. The work on these vessels already has been performed by the Newport News Shipbuilding and Drydock Co. It included fitting and furnishing of additional passenger accommodations. The vessels are assigned to the Dollar Lines' Round-the-world service and are giving good results.

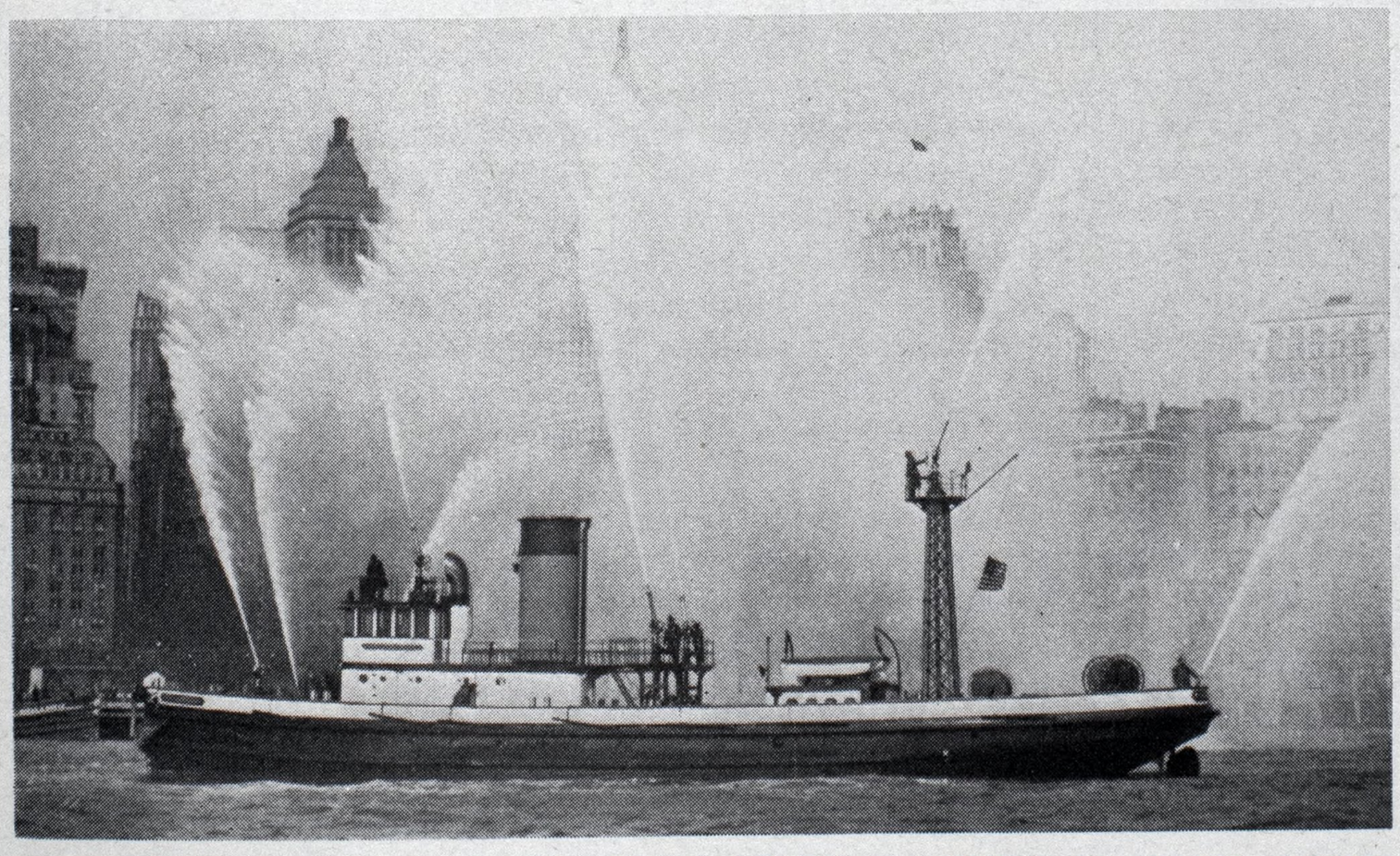
Rebuilt Fireboat Receives Final Tests

SUCCESSFUL tests were officially conducted Friday, March 28, on the fireboat JOHN PURROY MITCHEL at the conclusion of which the boat was given a rating of 100 per cent and accepted by the New York fire department. The result of these tests was a striking demonstration of the Todd oil burning equipment installed on the vessel which has brought about a 33 per cent increase in the rating of the JOHN PURROY MITCHEL by the national board of fire underwriters. The boat, although only seven years old had been found unable to generate sufficient steam to run the pumps at full power, so that the vessel was rated by the underwriters at only 67 per cent of her specified capacity of 9000 gallons of water per minute. The city authorities, having in mind the high efficiency of the two other units of the fire fighting fleet, the THOMAS WILLETT and the JAMES DUANE, both about 20 years old, but rated at 100 per cent since being reconditioned at the Todd Shipyards Corp. and equipped with the Todd oil burning system four years ago, decided to make a similar installation on the JOHN PURROY MITCHEL.

Accordingly a contract for reconditioning the boat was awarded to the Clinton plant of the Todd Shipyards Corp. The boilers were overhauled, the original oil burners, heaters, strainers and other auxiliaries were removed and the new apparatus installed. This consisted of the Todd mechanical atomizer wide range oil burning system and boiler fronts of the Todd assisted draft type, the draft being supplied by turbine driven blowers.

On completion of the job a test made at the Clinton plant showed that the pumps were delivering 9700 gallons per minute, or 700 gallons per minute above the specified capacity and that the safety valves were lifting at the same time, showing that there was more than an adequate supply of steam available. On a trial run, with the pumps operating at full capacity and the throttle wide open, the boat was able to operate at more than half speed and maintain the steam pressure under these conditions.

As a result of these demonstrations which were repeated during the official tests on March 28, the JOHN PURROY MITCHEL was given a rating of 100 per cent by the underwriters and was accepted by the fire department and restored to its place as the flagship of the fleet. Ability to operate at more pumping capacity has improved the serviceability of the boat so it is able to operate in a slip with its turret nozzles and to maneuver wherever may be required in order to fight a fire to the best advantage. Another advantage of the new wide range burner installation is that it enables the boat to hold steam economically standing by.



THE FIREBOAT JOHN PURROY MITCHEL COMPLETING FINAL TESTS AFTER INSTALLATION OF TODD MECHANICAL OIL BURNING EQUIPMENT

City of Philadelphia Buys Hog Island

Chairman O'Connor of the shipping board on April 9 announced the sale of Hog Island to the city of Philadelphia for $3,000,000, under a contract which provides for development of the property as a marine, air and rail terminal.

The terms of sale require a down payment of $450,000, and a guarantee that $500,000 will be expended at once for grading the portion of the land to be used as an airport. Improvements to the waterfront will be undertaken on the responsibility of the city. During the first 10 years of the city's ownership, 3 per cent per annum will be paid on the unpaid balance of principal as ground rental on interest and during the following 10 year period, or until the entire principal sum shall have been paid, 6 per cent will constitute this rental.

At the northerly end of the island's water front a seaplane landing basin having shore frontage of 1400 feet has been provided, leaving approximately 13,000 feet of waterfront for the marine terminal features of the project. All the area immediately back of this strip has been reserved for rail terminals and warehouses, and the remaining 307 acres of backland will constitute the airport.

Naval Architects Hold Meeting in London

The 1930 session of the Institution of Naval Architects was held from April 9 to 11 in the lecture hall of the Royal Society of Arts, London. An interesting program of papers was presented, as follows:

"Safety of Life at Sea (1929 Conference)" by Sir Westcott S. Abell, K.B.E., M. Eng., vice-president and A. J. Daniel, member.

"Some Materials Used for Marine Engineering Purposes" by Eng. Capt. J. Hope Harrison, R. N., member.

"Recent Results Obtained in Service with the High Pressure Steam Installation of the Holland-America Liner STATENDAM," by Dr. W. M. Meijer.

"Performance of Two Vessels with Electric Transmission Gear," by W. J. Belsey, member.

"On the Final State of a Gas Discharged from a Reservoir into a Space under Constant Pressure," by Col. F. Modugno, R. I. N., member.

"Notes on the Behavior of Two Passenger Vessels During a Voyage to and from Australia," by B. C. Laws, D. Sc., member.

"Stability of a Vessel with a List," by F. H. Alexander, M. Sc., member.

"Stress Distributions in Notched Beams, and their Application" by Prof. E. G. Coker, D. Sc., F.R.S., associate, and G. P. Coleman, B. Sc.

"Causes and Prevention of Vibration in Motor Ships" by Robert Sulzer, member.

"Vibration of Ships" by J. Lockwood Taylor, D. Sc., associate member.

"Sea Trials of Italian Flotilla Leaders," by Lt. Col. F. Dondona R. I. N., member.

"Experiments on the Resistance and Form of Towed Barges" by G. S. Baker, O. B. E., member of council, and Miss E. M. Keary, associate member.

"Ship Wave Resistance—Some Further Comparisons of Mathematical Theory and Experiment Result" by W. C. S. Wigley, M. A., associate.

Charles B. Phillips Dies

Charles B. Phillips, 53, general manager of the Atlantic Basin Iron Works, Brooklyn, N. Y., died at his home in that city, April 15, following an illness of about six weeks. Mr. Phillips had been connected with the Atlantic Basin Iron Works for nearly 25 years, the last four years as general manager. He was also a director of the company. For more than 20 years he was general superintendent. Mr. Phillips was a native of Hampton, Va., and before becoming connected with the Brooklyn firm was with the Newport News Shipbuilding & Drydock Co. He was a member of the Society of Naval Architects and Marine Engineers, the Propeller club, Brooklyn lodge of Elks, Maritime Exchange, Order of Maccabees, the Virginians and the Crescent Athletic club.

Veteran of Chelsea Piers Retires

Mortimer L. Burns, cashier and passenger agent of the International Mercantile Marine Co. at the Chelsea piers, New York, retired on April 1 after 37 consecutive years of service. He joined the White Star line in 1893 as assistant victualling superintendent and throughout his long career lost only three days due to illness.

The duties of Mr. Burns required his presence at the arrival and departure of each of the company's steamships to attend to mail and parcel distribution the exchange of money, the issuance of travelers checks, sale of tickets and the dispensing of general information. His records show that in the 37 years of service he has been present at 15,980 arrivals and departures of steamships.

Ready to Let Contract for Big Cunard Liner

According to reports, the Cunard line is to let a contract to John Brown & Co., Clydebank, Scotland, for construction of a liner which will exceed in size and speed anything now afloat. The answer of Great Britain to the BREMEN and EUROPA of Germany is said to be embodied in the letting of this contract.

Reports received recently from England carry the statement that the Cunard line, whose MAURETANIA held the blue riband of the Atlantic without question for a score of years, has reached a point in the negotiations with the shipbuilders where practically everything is in readiness for placing the contract.

Based on reports, the new super liner of the Cunard line will have a displacement of 75,000 tons, will be more than 1000 feet in length and will have a beam of 115 feet. The vessel is to maintain a minimum speed of 28 knots and it is believed will be capable of 32 knots in case the BREMEN and EUROPA should develop that speed.

Accommodations are to be provided for 4000 passengers. A crew of 700 is to be carried. Provided the keel of the vessel be laid this summer, the belief is that she cannot be completed before the spring of 1933.

Some idea of the power required to drive a vessel of this size at speeds between 28 and 32 knots can be gained from the fact that engine experts abroad are reputed to be working on turbines capable of developing from 190,000 to 200,000 horsepower which is 80,000 to 90,000 horsepower more than the BREMEN.

The company John Brown & Co. which it is reported will receive the contract, built the AQUITANIA and LUSITANIA. This yard is now building the new 40,000-ton liner EMPRESS of BRITAIN for the Canadian Pacific. This vessel is to enter transatlantic service in the latter part of 1931.

Provided John Brown & Co. are awarded the contract for building the new Cunarder it is said that Swan, Hunter and Wigham Richardson will be awarded a contract for building a sister vessel since the Cunard line is contemplating construction of another vessel to equal the BREMEN and EUROPA in the same number of sailings.

George Walker, dealer in ship instruments, on April 1 moved to new office quarters in rooms 710 and 711, 10 High street, Boston.

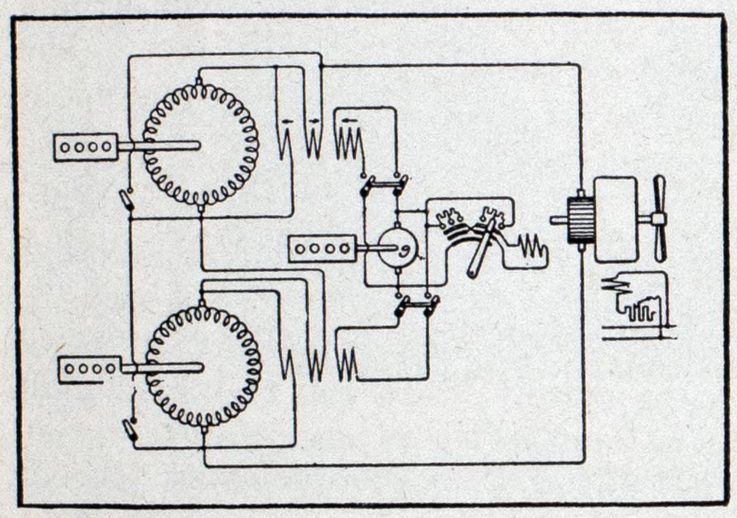
Patents Show Marine Development

Latest Marine Inventions Described

Specially Prepared for Marine Review
By Richards and Geier

Patent Attorneys, 274 Madison Avenue, New York

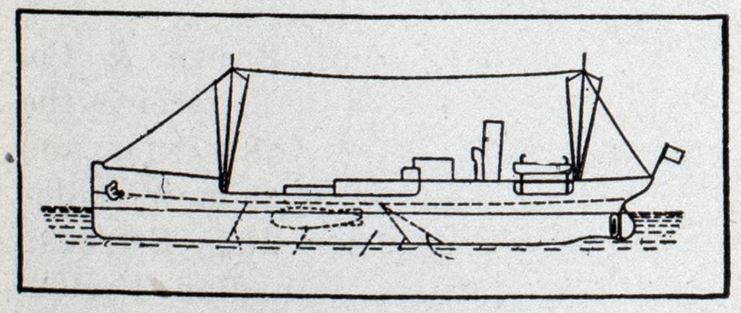
THIS invention relates to systems of electric ship propulsion wherein a propeller motor is supplied with current from a plurality of direct current generators driven by diesel engines or other prime movers subject to variations in speed and driving torque, and has for its object the provision of an improved arrangement for preventing stalling or reversal of a prime mover when its torque is decreased and the generator to which it is coupled tends to operate as a motor.



SHIP PROPULSION

United States patent No. 1,717,256, issued June 11, 1929, to A. A. Pollock, of Leaminton Spa, England.

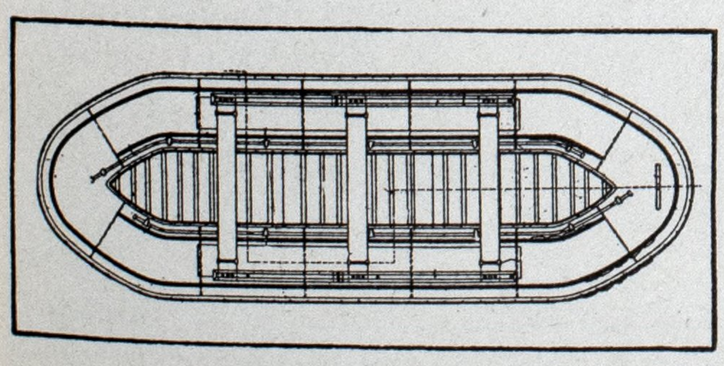
THIS invention contemplates a submarine to be used for diving purposes which, although constantly attached to a vessel on the surface, has its own radius of independent action.



DIVING CONTRIVANCE ADAPTED FOR DEEP-SEA DIVING

United States patent No. 1,694,108 issued to Johann-Georg Stein, Berlin-Halensee, Germany.

THE principal characteristic of the invention consists in forming the surrounding or outer shell so that



RAFT OR BOAT

United States patent No. 1,749,711. Issued March 4, 1930, to Hermann Meyer, of Berlin, Germany.

WE HAVE made arrangements with the patent attorneys, Richards & Geier to publish data relating to letters patent issued in the United States covering inventions which may be of particular interest to our readers. The patents described, some of which have accompanying cuts partially illustrating the inventions, are all of recent date and we are planning, in subsequent issues, to publish similar information on patents pertaining to various phases of marine development work. Should our readers be interested in obtaining a printed copy of any of the patents appearing in this issue, or any other patent desired, such copies may be had by addressing request to the editor or direct to the contributors of this page.

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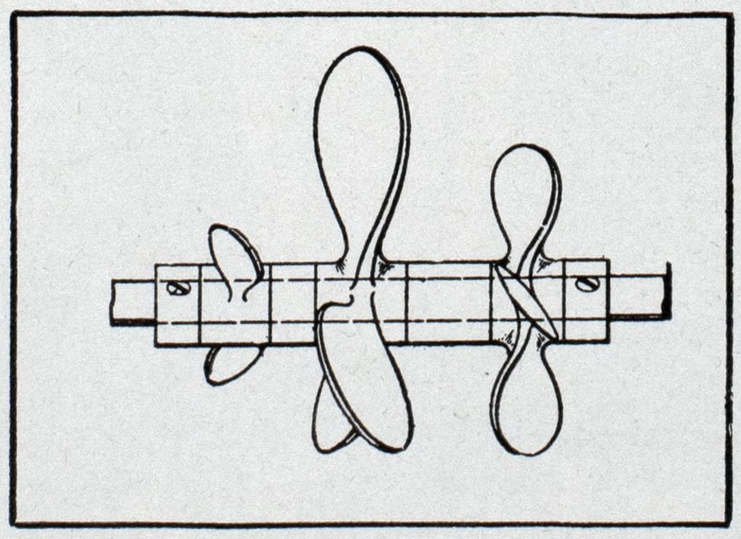
it is divided into a large number of float compartments, which can be inflated in groups or singly, and which can be isolated from one another, so that in the event of leakage of one of the float compartments, the air will not escape from the others.

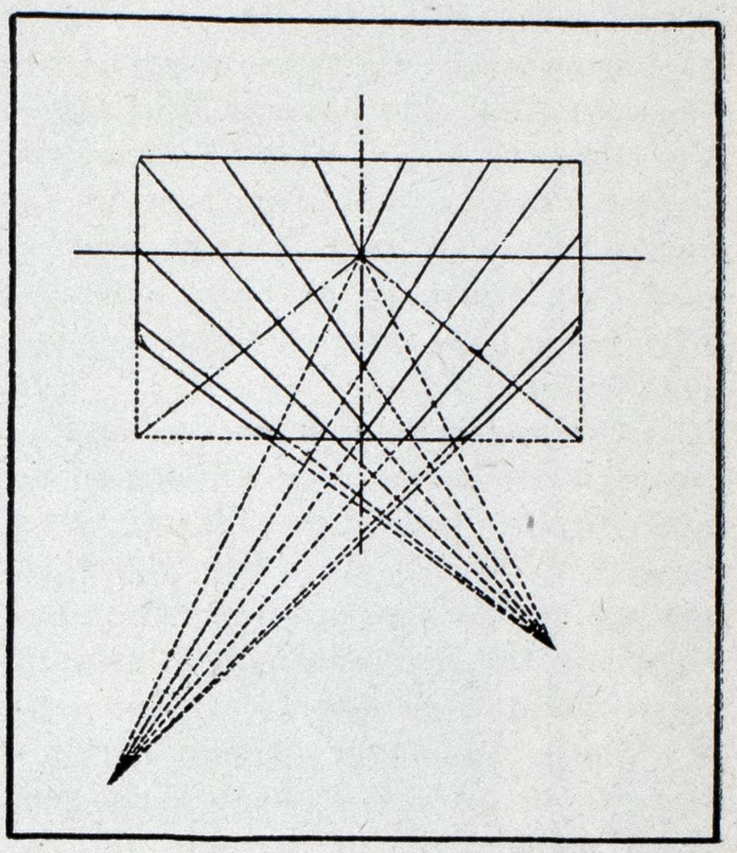
A PARTICULAR object of the invention is to provide a plurality of propellers which can be mounted upon a single shaft adjacent to each other, separated by various distances depending upon their pitch and the conditions under which they operate, and the size of the propellers being so arranged that they will overcome the conditions which have heretofore been objectionable in the use of propellers.



PROPELLER

United States patent No. 1,717,663, issued June 18, 1929, to George Checkley, of New York, N. Y.

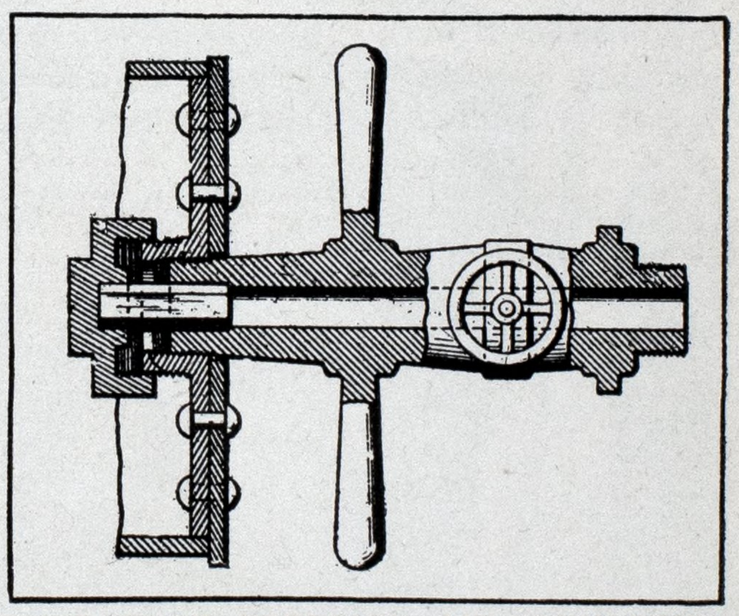
THIS invention relates to ships, and its particular object is the designing of vessels so as to determine the most favorable contour lines of the hull of such vessels below the water-line.



SHIPBUILDING

United States patent No. 1,736,315. Issued Nov. 19, 1929, to Hans Karl Kloess, of Hamburg, Germany.

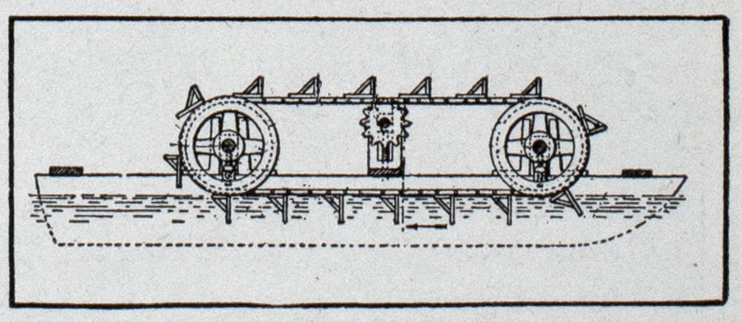
THIS invention relates to an apparatus for use in connection with rescue work on sunken submarines.



EMERGENCY EXTERIOR AIR-CONNECTION UNIT FOR SUBMARINES

United States patent No. 1,731,559. Issued Oct. 15, 1929, to John P. Ayer, of Portland, Maine.

THIS invention relates to an improvement in water motors and has for its primary object the purpose of providing a motor which can be operated in naturally flowing streams or rivers.



WATER MOTOR

United States patent No. 1,744,982. Issued Jan. 28, 1930, to George H. Merrick, of St. Louis county, Mo.

Modern Ore Terminal at Toledo

New Docks Nearly Completed—Unloading Capacity, 3600 Tons of Ore Per Hour—Three Electrically Operated Unloaders

By W. G. Hildebran

THE Hocking Valley Railway Co.'s newly modernly equipped ore docks at Presque Isle, on Maumee bay, at the mouth of the Maumee river, Toledo, O., are now nearing completion. The new docks are approximately three miles nearer the lake than the company's docks on the Maumee river. This location will permit docking and departure of vessels without the aid of tugs, and will eliminate six miles of river movement with river hazards, drawbridges and low water.

Ore-handling facilities consist of three Wellman stiff-leg all-electric unloaders for unloading directly from vessels to cars or to stock pile. This project is now nearing completion as shown in the accompanying illustration made from a photograph taken April 4. These unloading machines run on tracks 72 feet 6 inches apart, each track consisting of a pair of rails spaced 24 inches between centers. The forward track center is 5 feet 6 inches from the face of the dock. The unloaders are designed to excavate from ore carrying boats of typical sections and beams up to 65 feet. Ore will be loaded directly into railroad cars standing on any of the four tracks inside of the span, through disk hoppers and traveling scale larry cars.

The author, W. G. Hildebran, is assistant secretary of the Wellman Engineering Co., formerly the Wellman-Seaver-Morgan Co.

Each unloader consists of two parts, the main frame with cantilever which traverses the dock and the traveling trolley with bucket on top of the main frame. In operation the bucket will excavate from the vessel's hold and dump into the disk hopper between the main girders at the forward end. the ore will then be discharged from the disk hopper into a traveling scale larry car which carries and deposits the ore into the cars.

Front and rear legs of each unloader are mounted on 2 four-wheel equalized drive trucks at each end of the sills and an additional four-wheel spring truck at the center of the rear sill. Drive trucks are mounted in pairs, and all wheels on the drive trucks are connected to the moving motor through spur and bevel gearing and line shafting.

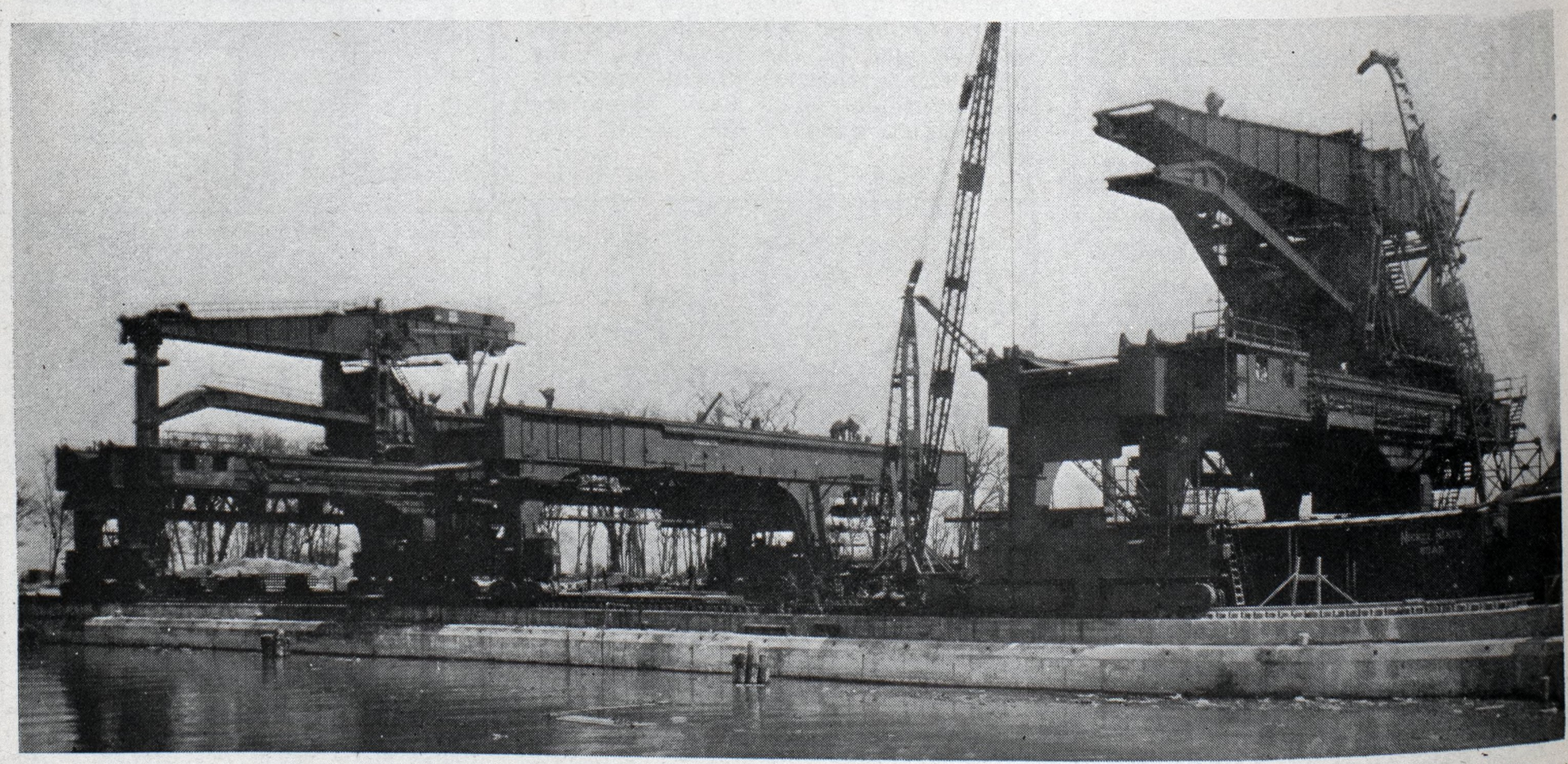
The disk hopper located at the forward end of each machine has a capacity of 50 tons, the dimensions of the hopper being such that the bucket may dump into the same rapidly without spilling. It is mounted on rollers to allow moving it to the rear of the machine to permit the bucket leg to pass through between the main girders making it possible to lower the bucket to the ground for repairs. The bottom of the hopper consists of two revolving disks which are driven through gear rings, bevel and spur gearing by a motor located at the rear of the frame.

Each machine is equipped with a traveling scale larry of 40 tons capacity mounted on a horizontal track suspended from the main girder and extending from the front leg to the rear end of the cantilever. Mechanism for traversing the larry is mounted at the rear end of the scale larry.

The hopper is suspended from the main frame by scales having registering and recording beams placed in the cab which is located in the front part of the main frame.

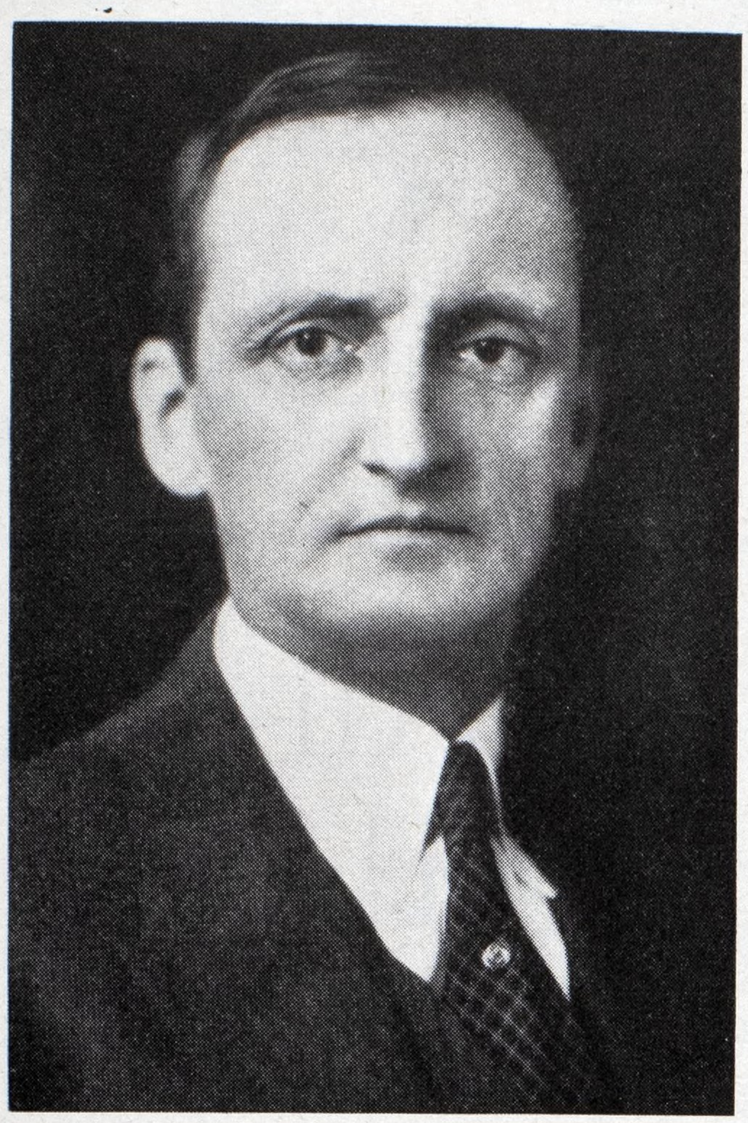
The trolley with its bucket is designed to make one trip in 50 seconds with 17 tons of ore, which results in an excavating capacity of approximately 1200 tons per hour for each machine. The machine travels at approximately 75 to 100 feet per minute. The bucket leg is designed for a total movement of 1⅝ revolutions per minute.

These are the first unloaders to be operated by alternating current. The two main motions, that is, the beam hoist and the trolley travel, are operated by direct current with variable voltage control, and the balance of the motions use straight alternating current with full magnetic controllers.

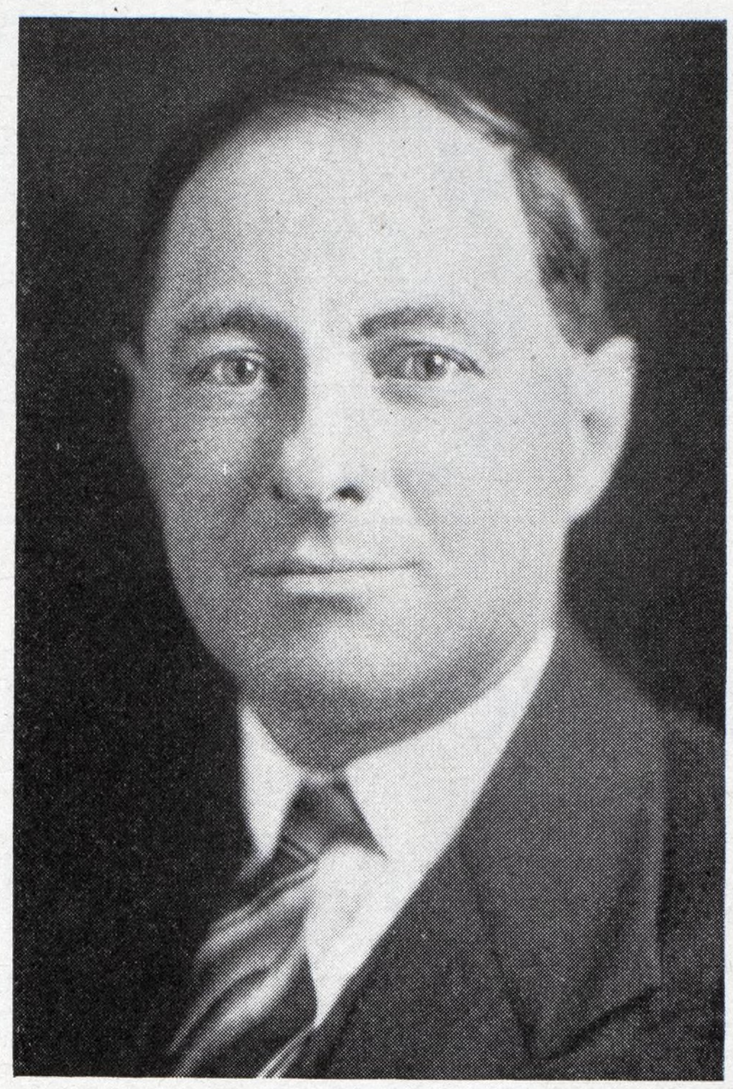


ORE UNLOADERS ON THE NEW DOCKS OF THE HOCKING VALLEY RAILROAD, MAUMEE BAY, TOLEDO, O.—TAKEN APRIL 4

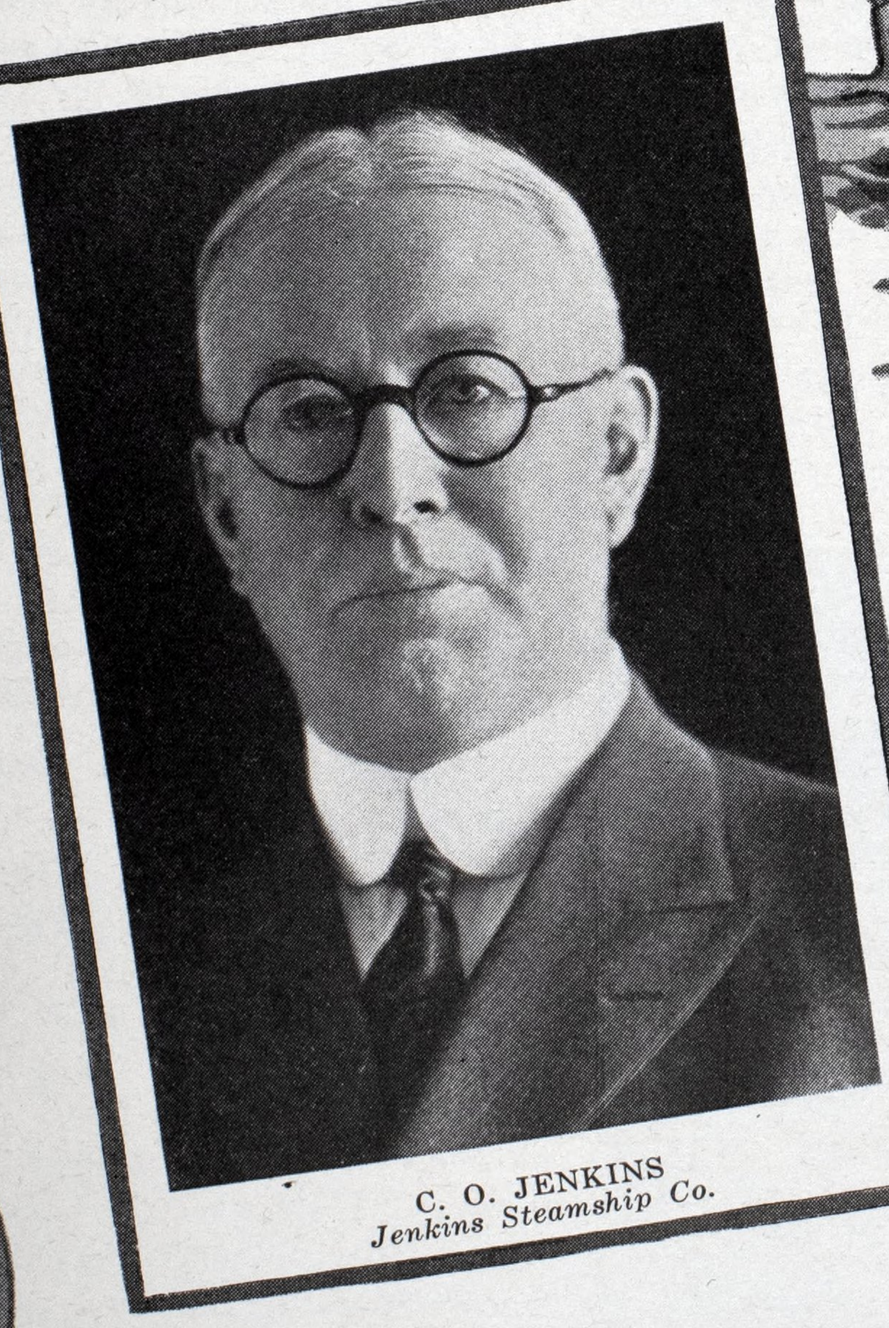
MEN of MARINE AFFAIRS



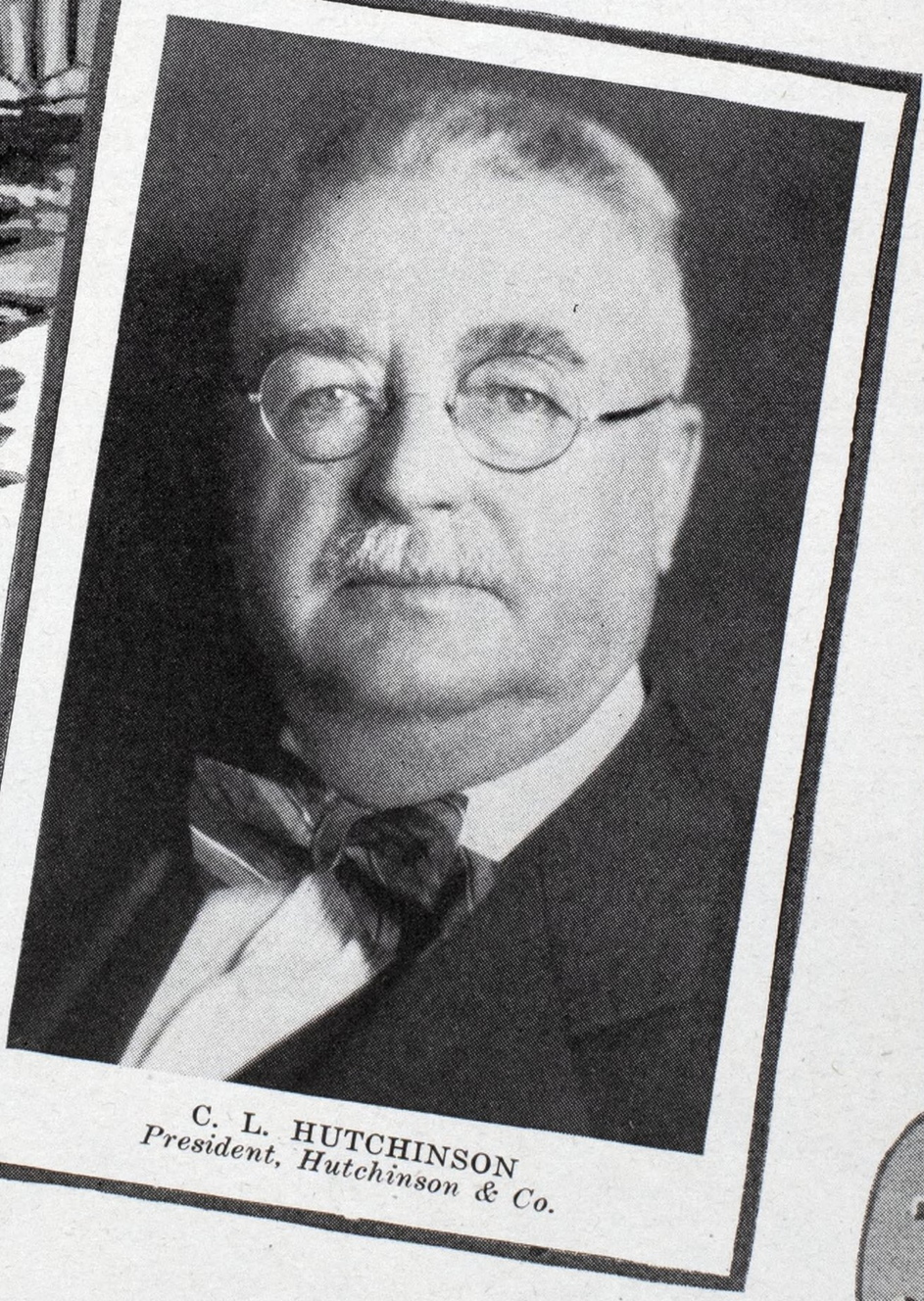
A. E. WATTS
President, Sinclair Navigation Co.



P. E. WINSLOW
Eldredge-McInnis Inc.

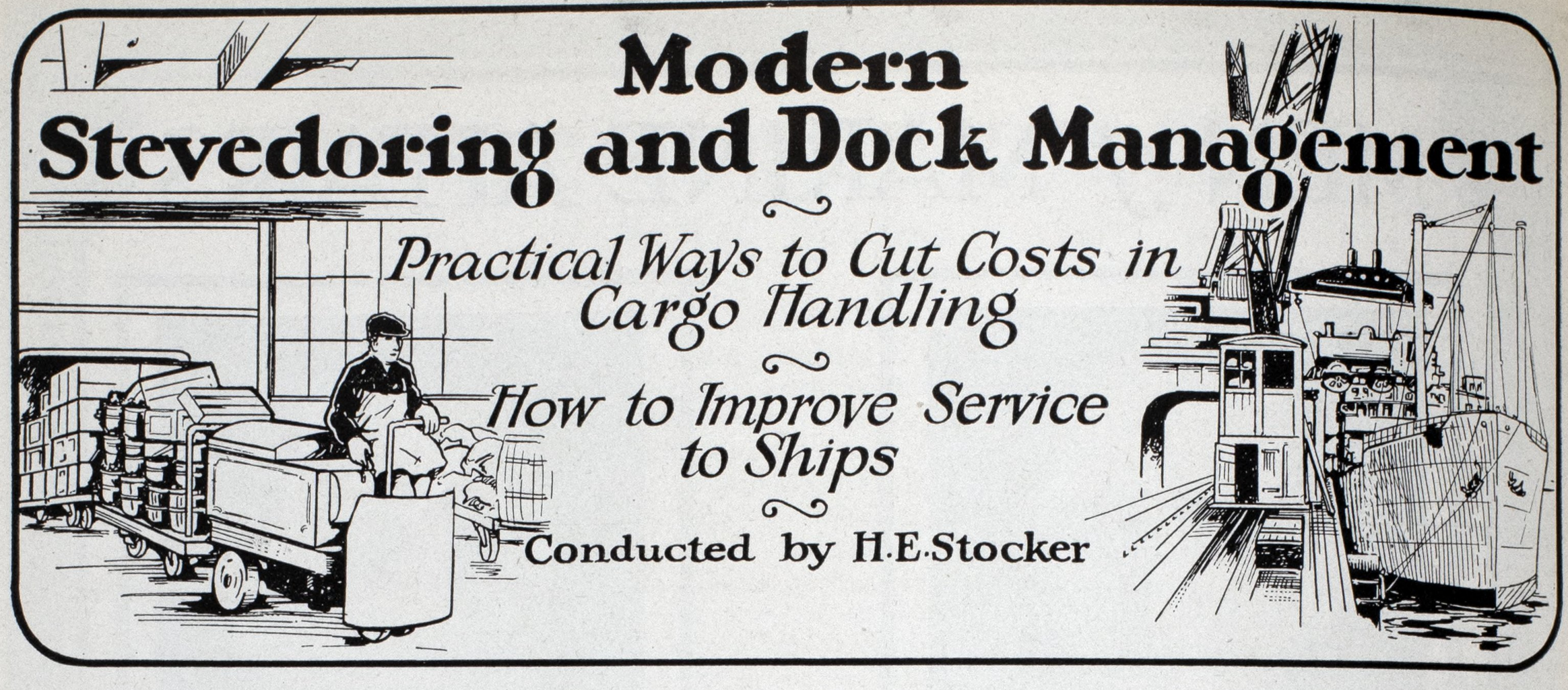


C. O. JENKINS
Jenkins Steamship Co.



C. L. HUTCHINSON
President, Hutchinson & Co.

Photos by Blank-Stoller, Inc.



Chicago Preparing for All Water Transportation to Atlantic

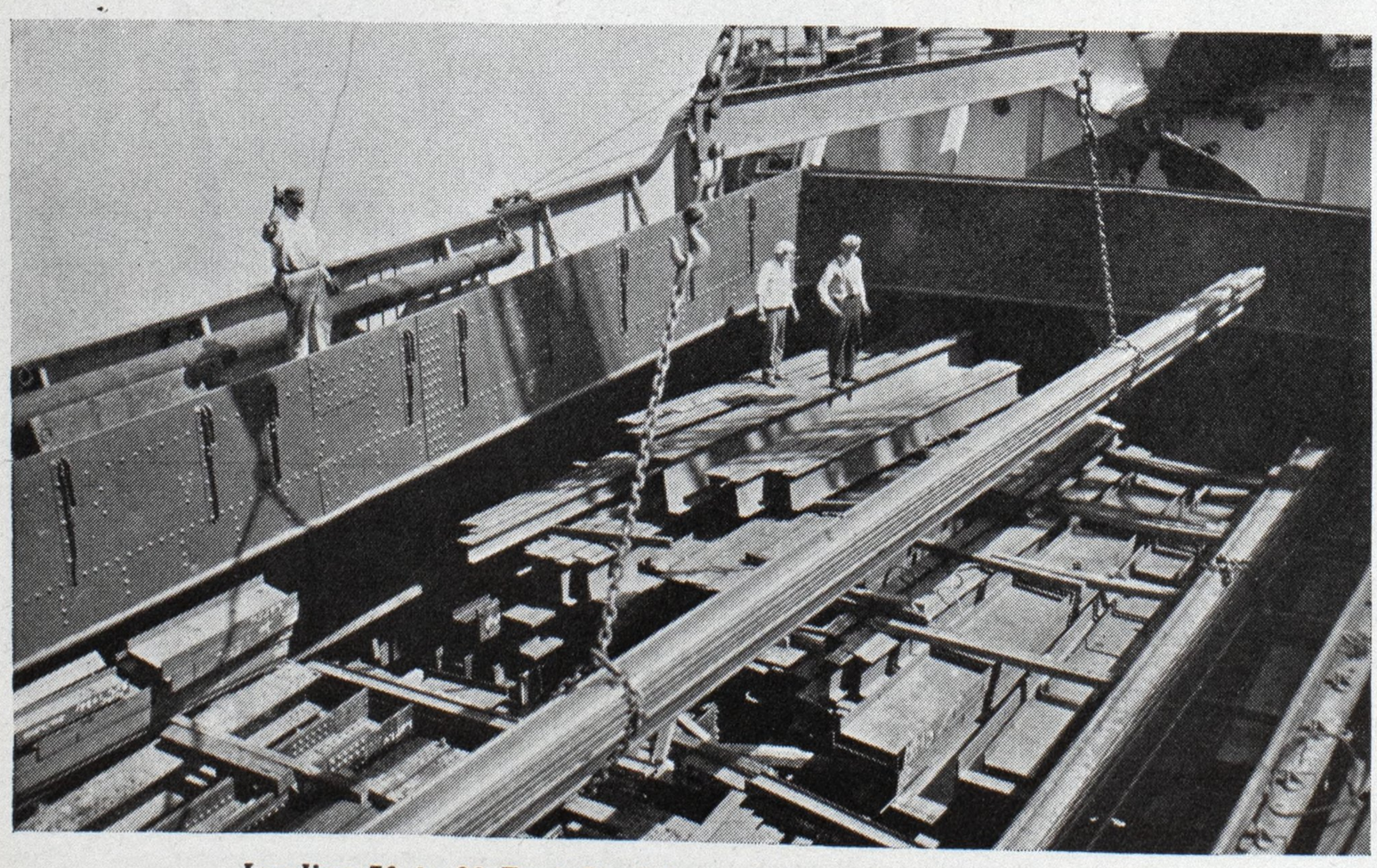
By W. W. Huggett

CHICAGO has been frequently termed unique among the cities of the world. Among the many factors making for its importance and distinction are its unparalleled transportation facilities of both rail and water. Statistics show that metropolitan Chicago is the world's largest inland port, full consideration being given to tonnage of bulk commodities such as ore, coal, grain and stone.

Just as the arrival of a locomotive, the Pioneer, on board a sailing vessel in 1848 marked the beginning of Chicago's railway era, so the construction of the new East Chicago dock terminal, located at the fork of the Indiana harbor canal, in its own sphere is just as epochal because it has created new channels for the movement of bulk cargoes that heretofore on account of lack of proper handling facilities could not be transported in union with lake service

The management of the National Terminals Corp. who own and operate the East Chicago Dock Terminal Co. as well as the North Pier Terminal warehouse at the mouth of the Chicago river, and many other similar properties, was among the pioneers who sensed the importance of the movement of bulk commodities through the Chicago gateway at lower rates than obtainable through the usual all-rail channels and the necessity of looking to the arteries of the Great Lakes for these differentials. Further, in checking lake rates as against rail rates it was found that the Chicago district did not possess facilities for handling, storing and distributing bulk commodities to or from the industries located inland or in the metropolitan Chicago district. It was necessary in order to move these bulk commodities in boat loads to have someone establish docks equipped with proper facilities and machinery which the National Terminals organization did in 1928.

The author, W. W. Huggett, is vice president and general manager of the North Pier Terminal Co. and the East Chicago Dock Terminal Co.



Loading 70 to 90-Foot Steel from Steamer to Car at Chicago

Steel From East Seaboard

The operation of the bulk cargo dock at East Chicago affords many peculiar handling problems. Because of the many diverse commodities handled across a dock of this nature the machinery and handling devices must be flexible and ready at all times to cope with peak conditions.

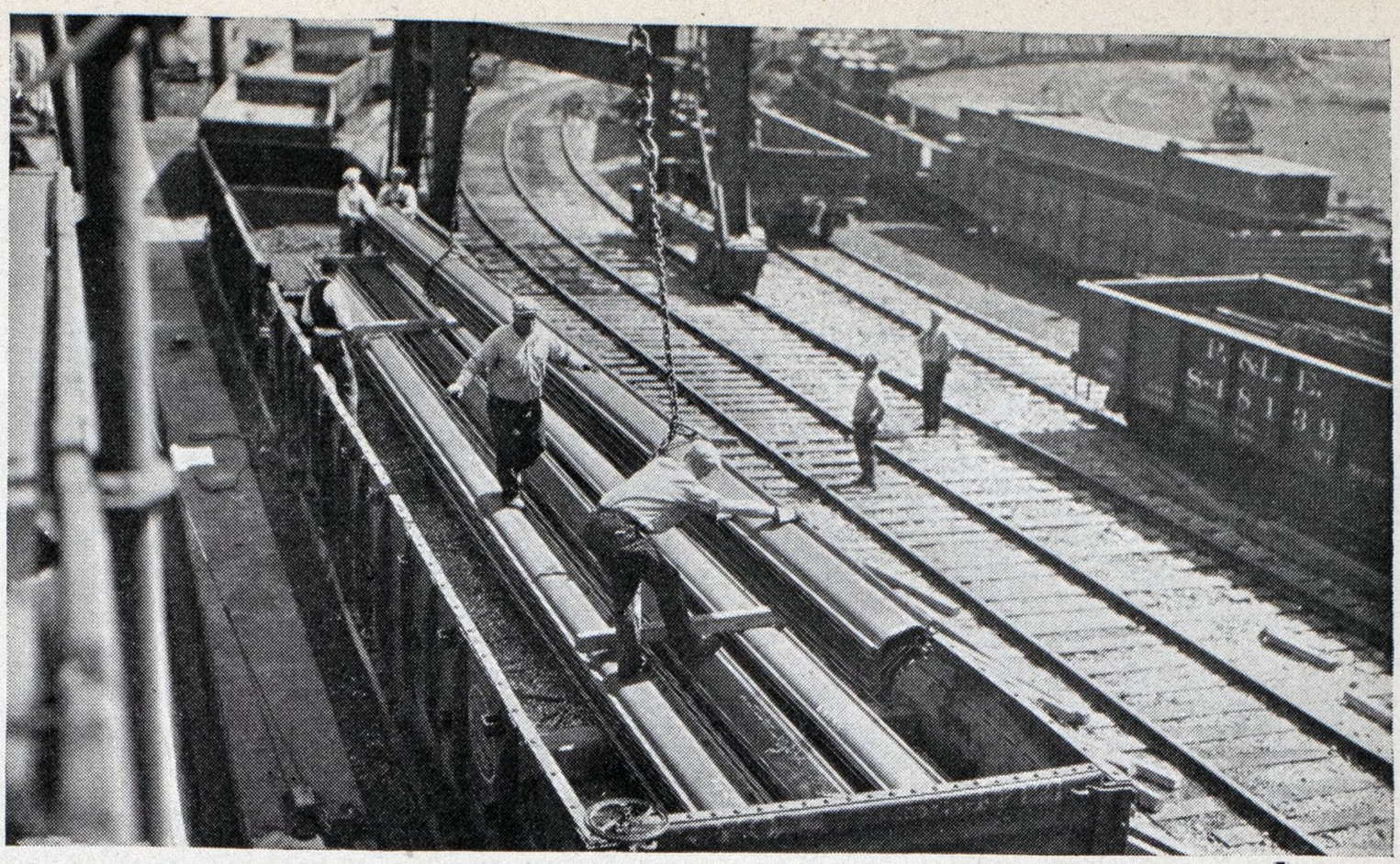
Considerable traffic has sprung up in connection with the movement of steel from the East via water to Chicago, thence transported in cars for use in either the Chicago district or the middle West. These vessels frequently have cargoes that are made

up of almost every conceivable type of steel product, ranging from kegs of bolts, coils of steel to billets, pig iron, plates of every size and description, circular steel pieces, long flexible rods and oft times beams eighty or ninety feet long, as well as both fabricated and unfabricated structural beams. Such a cargo calls for unusual handling and a very thorough system has been developed. When the vessel departs from the loading dock a manifest is sent forward listing on what are commonly termed dock receipts the various lots, consignee, forwarding instructions and description of items making up shipment loaded in cargo, together with a diagram of the ship showing location of all lots. These manifests permit the operating force to familiarize themselves in advance with the contents of the cargo. A list of rail equipment essential to handle the cargo is then made up divided as to length and type of cars to accommodate the many diversified lots.

A stowage plan is prepared which enumerates the lot and right next to it the type of rail equipment necessary so that both the yard foreman as well as the unloading force on ship and ground are familiar with the location of lots—just how they will come out of the boat in tiers and equipment for handling.

In loading cargo, care is exercised in stowing lots; separations generally being made in tiers by use of dunnage so that lots can be lifted from the hold of boats in more or less uniform fashion of three to five ton lifts and placed directly in cars by the dock cranes.

Prior to the arrival of a vessel a car blocking force or that group assigned to the building up of cars for what



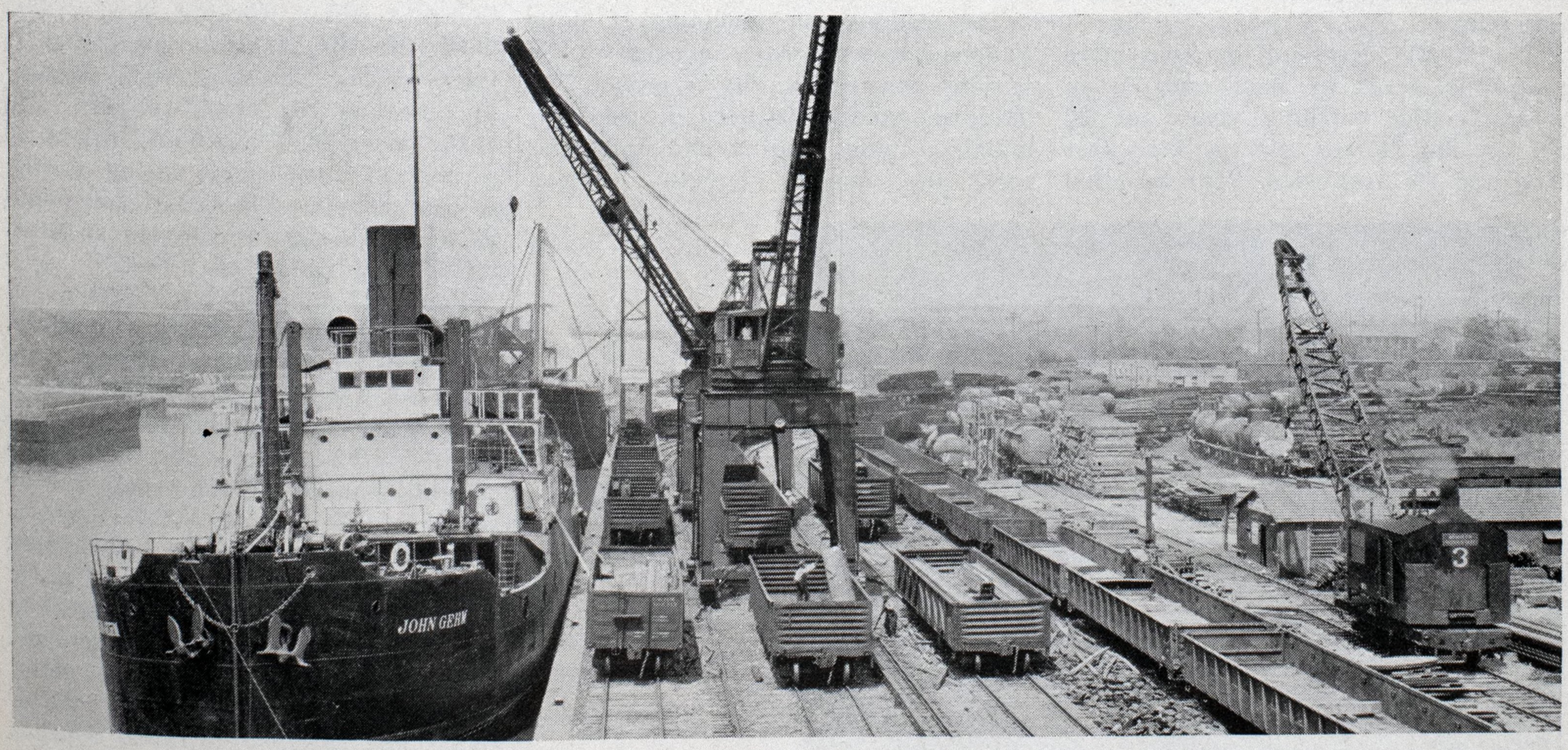
Ten Ton Lifts with Chain Slings of 60 to 90-Foot Steel

are termed twin loads or special loads, are notified of the number of cars required for this purpose, and after cars are placed on special blocking tracks they are prepared by this force for loading by arranging sufficient blocking timbers, sliding plates and other details in comformity with the American Railway association requirements.

From Ship's Hold to Cars

The actual unloading operation which takes place after the boat docks and subsequent to these preliminary preparations is made in a direct fashion. There are five long unloading tracks utilized for this unloading. Two 30-ton 70-foot boom, electric gantry cranes work on each vessel—one in the forward hatch and the other in the after hatch. Unloading from both ends taking place simultaneously. The yard force endeavor to have proper equipment placed on the most convenient track for loading so that no time is lost waiting for equipment or spotting for load.

The unloading crew operating in the hold of the vessel are directed by a signalman who is in charge of this particular operation from ore deck and directs the men in the hold to place the chains or cables around the proper lots in conformity with the checker's instructions, who is also in the hold with the unloading crew. The lot is then checked off the manifest and charged against the car it is placed in, on a proper checking tally sheet. The handling of the lift from the hold of the ship to cars is direct and the signalman is responsible for its movement until it is out of the vessel. Each car of steel that is being loaded has its own individual loading crew who prepare the car with proper dunnage so that the lift is promptly laid down chains or cables released



Direct Transfer of Cargo from Ship to Cars at East Chicago Dock Terminal Co., East Chicago

Loading Crude Oil from Tanker Direct to Cars by Means of Underground Pipe Line at East Chicago Dock

and another lift started for either the same car or another one to which the following lift may be assigned.

In handling long steel, care is exercised to prevent damage in transit by loading under the jurisdiction of railroad car inspectors who examine same to see that it is properly braced and tied. This operation of bracing and tying is performed by the car blocking force while the car is in process of being loaded and generally completed shortly after the last lift is placed.

It is most interesting to view the miscellaneous assorted groups of items that leave the yard from such a cargo which when they depart from the dock are billed through to destination by the office force after checker's tally sheets are first compared with dock receipts.

One private switch engine and crew are maintained on the dock day and night for the purpose of spotting cars under cranes for loading or unloading, switching from one track to another and handling cars to the various railroads. This engine service is important to vessel owners and operators for the reason that it results in 100 per cent of the time at the dock being used solely for the operation of either loading or unloading vessels and no time is lost by cranes while waiting for engines to be found or necessary switches to be made.

Sand, gravel and coal are also stored and handled on the dock, these commodities being unloaded either by the company's own equipment (buckets) on cranes or by self unloading boats with long booms working on the

(*Continued on Page* 50)

Where Mechanical Handling Cuts Costs

By H. E. Stocker

TWENTY-EIGHT electric chisel trucks are in service on the pier of the Mystic Terminal Co., a subsidiary of the Boston and Maine Railroad Co., at Charlestown, Mass. The car loading and unloading costs have been cut materially by the use of these trucks. When two wheel hand trucks were used, the cost of loading granite blocks was 60 cents a ton. The chisel trucks do the same work for 11 cents a ton, a reduction of 81.6 per cent.

The Mystic Terminal Co. owns more than 100 acres of land and eleven piers, having berthing space for 17 ships. The largest pier is 1300 feet long and 175 feet wide. The terminal is divided into two major sections, the Hoosac tunnel docks, east of the navy yard, and Mystic wharf, west of the navy yard. Track facilities are provided on all piers, depressed tracks in center of the pier to facilitate loading and unloading cars, and surface shipside tracks for handling cargo direct between ships and cars. Numerous portable bridges cross the depressed tracks to shorten trucking distances.

The loading and unloading of ships is done by stevedores employed by the various ships using the terminal. The 28 chisel trucks are used by the Terminal company loading and unloading cars and moving freight between

Heavy Casks Can be Handled by the Chisel Crane with Ease. Two Level Tiering is Also Possible

points on the piers of the terminal.

The general character of the construction of the chisel trucks is shown by the accompanying illustrations. The chisel is made up of three pieces of steel four inches wide with an overall width of 22½ inches and projecting out twenty-four inches. These prongs are tapered to a fairly sharp edge so the chisel can get under bales, rolls, boxes, etc., without great difficulty. The chisel is operated by a separate motor working a wire rope hoist. It tilts back 35 degrees as it rises so that the load rests securely in place as the truck travels. The chisel rises to a maximum height of 4 feet 11 inches, permitting tiering to that height. The truck steers with all four wheels, resulting in an overall turning radius of 7 feet.

Power is supplied by a fifteen cell twenty-one plate storage battery. Formerly nineteen plate batteries were used but to get longer runs without recharging, the larger batteries are used, in all but two of the trucks. The weight capacity of the truck is 3500 pounds. There are three speeds forward and one reverse. With good floor conditions, the trucks can attain a maximum speed of five miles an hour. Bales of woodpulp, cotton and wool, blocks of granite, case goods, china clay in bulk, pig iron, rolls of paper and sacks of nitrates, cements, are handled by these trucks.

Three and four bales of woodpulp weighing from 175 to 450 pounds, are picked up by running the chisel under the bottom bale. As the chisel elevates and tilts backward, a helper steadies the load. The truck goes into box cars and drops the load by lowering the chisel and backing away from the load when the forward part of the bottom bale rests on the floor.

When loading a car with woodpulp that is stored on the upper deck of a pier, one truck is taken to the second floor on an elevator. There the truck carries the bales from storage to a chute. The load is dumped into the chute and is picked up by a second chisel truck at the bottom.

The load is made up by running the chisel under one bale, elevating it and backing off, then running up to a second bale and placing the first bale on top of the second bale. This operation is repeated until the desired load of three or four bales is made.

When the truck is fully loaded it is run down the pier to the box car, enters the door and places the bales on the floor. The four wheel steering makes the truck easy to handle in the restricted space encountered on the pier and in the car.

The chisel trucks are also used in tiering bales of woodpulp. The woodpulp can be piled only seven bales (450 pounds) high because of the floor loading limit. This height is reached by first placing three bales and then by placing four bales on top of the three bales.

Bales of cotton weighing 750 pounds each are picked up quickly by driving the chisel under the bale. The truck is first equipped with a wooden rack that clamps on to the back of the chisel. This rack keeps the bale far enough forward so that when the load is to be dropped, the bale rests on the floor, permitting the chisel to be pulled from under the bale.

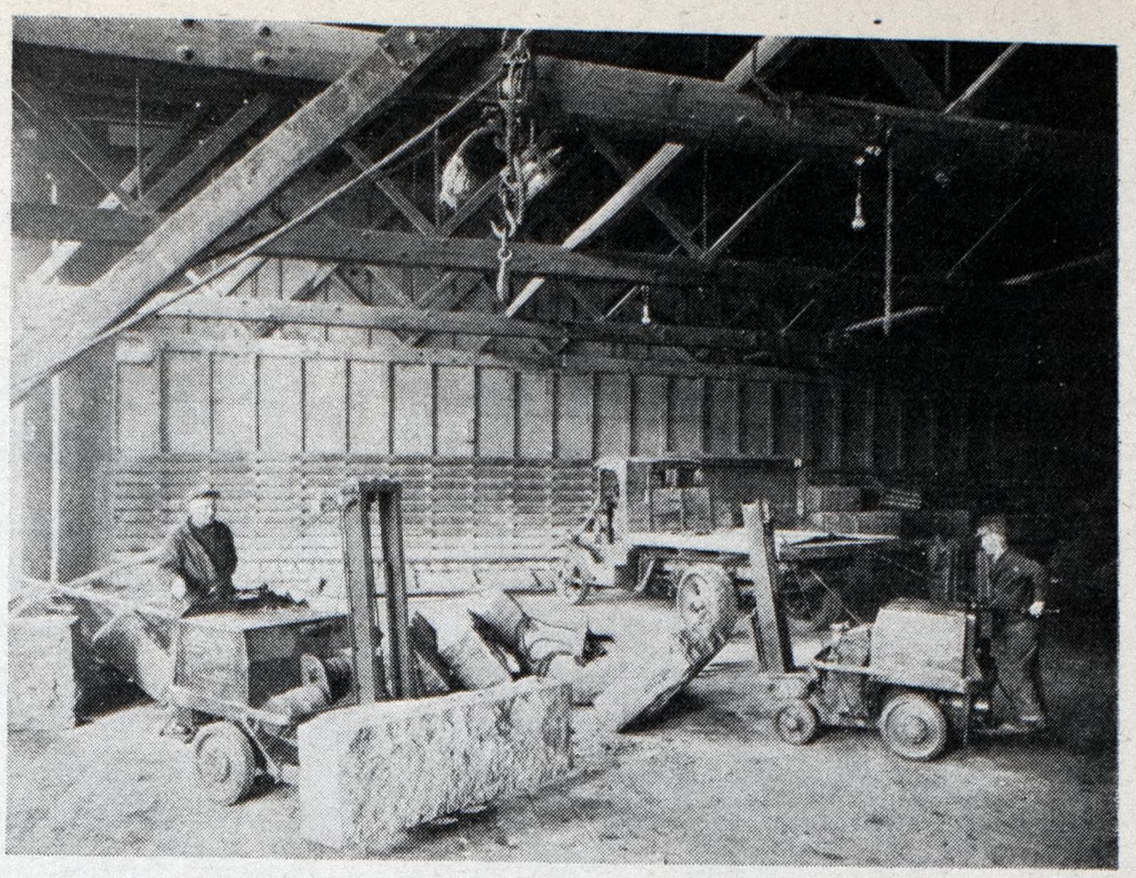
Rolls of wrapping paper weighing from 1000 to 1700 pounds are easily picked up by the trucks. One man keeps the roll from rolling off the chisel until the chisel is tilted back far enough to hold the roll. These heavy pieces of freight are picked up and carried and piled two high in a box car with as much ease as a man handles a 150 pound case with a two wheel hand truck.

Canned goods are first placed on a rack. The rack is so constructed that the prongs on the chisel may lift the load and leave the rack on the floor. The truck is fitted with a rack similar to the cotton rack so that the load may be dropped easily when the truck unloads in the box car.

Even china clay in bulk is handled by the chisel trucks. A bucket is attached to the chisel. This is filled from a hopper, carried to a car and unloaded automatically by raising chisel to the maximum elevation. The hopper is filled from the ship's tackle. There is also an experimental pneumatic system in use whereby the transfer is made direct from ships hold to car by air.

A car loading gang, operates with two chisel trucks. Two drivers, two helpers or floor men, and one checker who acts as a foreman do the work which formerly took two hand truck gangs of seven men each to do, a reduction of 64 per cent.

The chisel truck gangs operate on a group bonus plan. The terminal is divided into sections. A base rate is fixed for each commodity handled for hauls from any one section to any other section. When a job is undertaken the gang foreman looks at the blue print of the pier, gets the symbol that represents the haul involved, and notes it on the time sheet. If the gang completes the job at a cost lower than the base rate, the saving goes to the gang, the truck drivers getting slightly more than the other gang members as a special extra incentive.



Granite Blocks Are Carried on This Type of Truck at the Mystic Terminal, Charlestown, Mass., Quickly and at Low Cost

In addition to the 28 chisel trucks used on the piers, there is an electric portable crane, two lift trucks, 500 skids and 50 trailers. The skids and trailers are used primarily in handling small package freight. The skids are handled directly into ships thereby avoiding additional handling. The trailers are pushed by hand for short hauls, and are hauled by chisel trucks when the hauls are long in order to save time.

Charging equipment is provided to take care of twenty trucks at one time. The batteries are given a boost at noon and again between five p.m. and seven p.m., if overtime is to be worked.

The first mechanical equipment used by the Mystic Terminal Co. were four platform trucks and one crane acquired in 1917. The first chisel truck was tried out in May 1927. It was purchased after its ability to cut costs had been proved. Additional electric chisel trucks have been added from time to time, until the present.

The economies following the introduction of this equipment have been so large that the equipment paid for itself in approximately one hundred working days, a very good record.

Wood Pulp Packages Are Easily Tiered Four High Without Use of Hand Labor. Quicker and Lower Cost

Chicago Sea Terminal

(*Continued from Page* 48)

conveyor principle.

Crude oil from producing fields adjacent to the Great Lakes has been handled direct to the dock in large barges and tankers and pumped direct to tank cars, the entire operation of unloading a vessel with from 12,000 to 15,000 barrels of oil involving an average of ten hours to the cargo.

Pig iron and spiegeleisen of special analysis from Baltic and United Kingdom ports have been transported direct to our dock without the usual transfer of cargo at either Montreal into small canal size boats or at various Atlantic seaboard ports into cars. Distribution of this iron over the dock has been directed to their respective markets. The handling of this spiegeleisen involved the construction of special large open buckets for hand-loading from ship operated with automatic trip for unloading to either car or ground storage. This operation was necessary because spiegeleisen is non-magnetic and will not permit of being lifted from hold of boat by the usual electric magnets operated from cranes, nor can it be handled by clam shell or orange peel buckets.

There is now under consideration, at East Chicago, the construction of a large transfer shed to permit the direct transfer of package freight from boat to cars or warehouse such as sugar, flour, canned goods, wood pulp, newsprint, feed, and other commodities. This operation should be handled very efficiently from a location such as East Chicago for the reason that the terminal is served by four of the most important rail lines in the Chicago district, the Indiana Harbor Belt line, Baltimore & Ohio Chicago Terminal railroad, Elgin, Joliet & Eastern railroad and the Pennsylvania.

At East Chicago the installation of bridge cranes for the transfer and storage of fine bulk commodities such as ore, sulphur, etc., is being considered. This is in conjunction with the ultimate development of 97 acres into a large outdoor storage yard having facilities for grain elevators, storage tanks for liquid bulk commodities, lumber, building material, construction machinery, etc.

At the mouth of the Chicago river the National Terminals Corp. own and operate the North Pier terminal a unit comprising approximately two million square feet which caters exclusively to the package freight trade. At the North Pier a considerable tonnage of newsprint is being handled for the account of the large Chicago newspapers which arrives here in vessels from eastern and Canadian mills.

A great many other products used by the chain store grocers, wood pulp, nitrate of potash, in fact any and all package lines are handled. These commodities are all handled by special trucks and conveyors, both power and gravity, chutes and slides.

The last season has marked the first all-water movement direct from the City of New York and Philadelphia via the Hudson river, Erie barge canal thence on the Great Lakes to Chicago, of sugar cargoes in diesel driven motorships especially constructed for this trade, effecting a through movement without the necessity of breaking bulk. This semi-monthly through movement of merchandise from the Eastern seaboard to Chicago via the route mentioned above called for considerable initiative and presented some unusual handling problems contingent upon the first movement of such cargoes and also because of the peculiar construction of these motor driven barges, none of which possess any unloading machinery. A very thorough study was made of these ships and after the first handling special stiff-legs designed to fit both on the deck of the ship and face of dock were fitted up with sufficient radius to permit of quick and easy handling of sugar in slings. Return cargoes have generally consisted of cartoned goods of more or less uniform size and handled through the medium of special chutes constructed to allow cases to move in a continuous route from either floor of warehouse down to the hold of the boat or direct from cars at East Chicago via the same system.

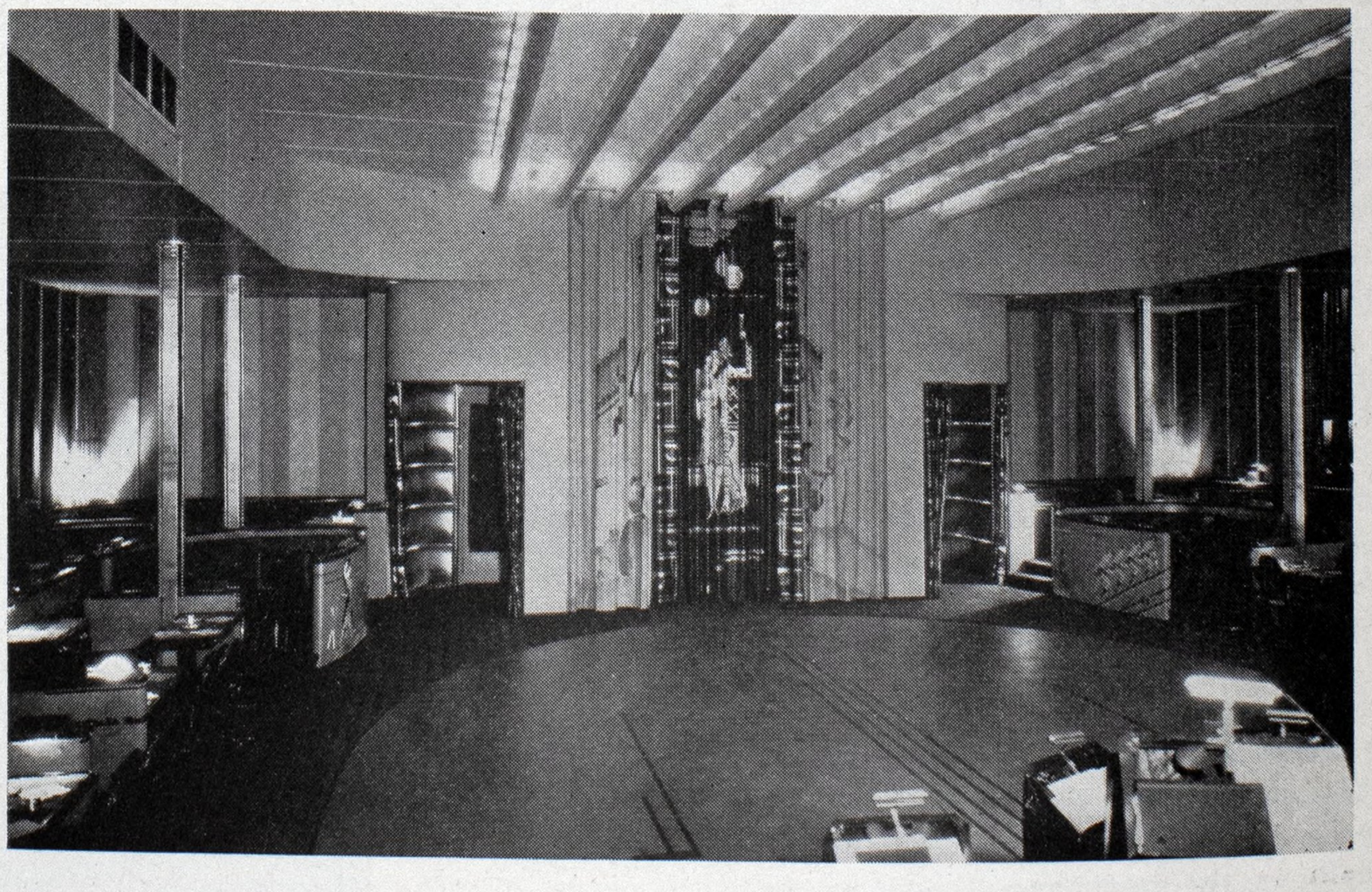
At a special meeting of the board of directors of the *Marine Journal*, New York, held March 31, Frederick P. Palen was unanimously elected president of the corporation publishing the *Journal*.

Mr. Palen, who was formerly vice president of the Newport News Shipbuilding & Dry Dock Co., was recently selected by Joseph E. Sheedy, vice president of United States Lines Inc., to supervise the construction of the two superliners to be built for the transatlantic passenger trade.

Night Club on Steamship Leviathan

OCEAN travelers saw a little bit of Broadway at sea when the LEVIATHAN of the United States lines sailed Saturday, April 12, on her first voyage to Europe after reconditioning and redecorating.

The accompanying illustration shows the interior of the Club Leviathan which is gorgeous in color and in modernistic design. The general color scheme is dark brown, gold and crimson with orange and blue as contrasts. The ceiling is treated so that it would appear as though one is under the open sky. Gaily painted curtains from frames offset the gold background.



Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1930	546	2,490,027	562	2,470,228
February	508	2,280,543	512	2,272,393
January	542	2,506,444	572	2,658,125
December	517	2,331,342	518	2,257,424
November	520	2,236,677	537	2,387,932
October	564	2,591,207	561	2,561,403
September	577	2,642,897	567	2,548,764
August	584	2,537,306	626	2,775,730
July	580	2,648,419	588	2,582,929
June, 1929	575	2,511,671	582	2,582,929

Philadelphia

Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1930	96	285,754	58	190,093
February	86	248,417	67	194,809
January	94	281,558	66	202,453
December	87	237,510	49	143,761
November	80	222,026	48	133,872
October	99	262,305	62	154,401
September	107	282,105	61	145,895
August	110	271,857	54	120,595
July	120	321,726	70	188,269
June, 1929	97	254,811	61	140,065

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1930	85	271,423	57	193,317
February	87	281,012	44	159,767
January	93	306,097	42	128,581
December	95	286,749	62	208,978
November	101	332,269	67	221,318
October	95	310,386	56	196,590
September	139	387,061	106	265,839
August	139	387,061	106	265,839
July	151	376,620	109	327,487
June, 1929	135	309,662	103	268,270

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1930	16	45,201	21	59,234
February	26	71,155	21	57,834
January	27	72,734	26	71,929
December	22	47,329	23	51,644
November	26	51,231	26	50,475
October	25	54,402	25	56,022
September	30	58,497	30	64,559
August	32	59,299	31	58,111
July	31	55,932	31	53,761
June, 1929	29	49,060	28	47,961

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1930	7	31,668	5	23,382
February	12	44,382	7	28,774
January	13	48,880	5	24,055
December	10	35,615	4	16,406
November	10	38,203	6	22,371
October	6	20,741	8	32,974
September	9	38,226	5	23,339
August	6	24,438	6	25,315
July	12	38,408	9	29,585
June, 1929	11	40,920	7	31,040

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1930	26	103,710	44	159,420
February	31	123,100	47	185,192
January	31	122,031	44	165,208
December	39	146,486	53	118,117
November	34	129,809	65	234,575
October	39	148,172	59	221,007
September	33	129,576	52	191,302
August	45	166,207	65	229,834
July	42	151,702	54	198,109
June, 1929	30	109,084	47	170,643

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1930	141	438,638	139	433,168
February	139	432,422	142	431,664
January	131	422,932	135	435,506
December	134	415,201	134	425,362
November	132	438,274	137	446,120
October	138	450,603	146	463,723
September	117	374,893	108	355,532
August	141	444,315	150	466,464
July	160	499,292	158	485,913
June, 1929	135	430,355	134	427,138

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1930	21	47,835	59	180,510
January	13	27,927	75	208,959
December	30	75,636	58	164,287
November	39	50,600	79	204,216
October	32	87,466	79	209,997
September	27	67,040	74	189,010
August	32	86,983	95	256,104
July	32	74,562	97	220,215
June	23	39,983	78	160,520
May, 1929	29	80,599	89	228,221

Jacksonville

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1930	17	26,625	12	23,963
February	14	35,002	13	31,353
January	12	24,225	16	31,722
December	19	36,831	12	20,409
November	10	22,938	10	18,750
October	12	20,268	8	19,134
September	17	36,618	13	23,731
August	18	45,422	10	15,617
July	12	21,338	12	22,111
June, 1929	14	21,699	16	35,889

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1930	93	89,490	76	86,235
February	85	90,050	70	87,109
January	74	86,081	71	85,990
December	68	78,984	65	78,634
November	84	97,555	83	97,217
October	74	88,850	75	88,853
September	55	64,464	59	72,321
August	60	70,851	60	68,913
July	72	84,674	67	80,233
June, 1929	68	81,920	68	78,980

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1930	131	280,484	126	286,119
February	104	254,408	116	276,137
January	118	281,672	108	256,384
December	110	262,685	101	238,149
November	107	231,376	111	259,712
October	123	304,950	119	294,276
September	91	208,323	83	213,660
August	96	233,785	83	193,379
July	110	267,053	109	264,552
June, 1929	97	204,219	98	218,437

Seattle

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1930	52	205,674	59	245,363
February	55	231,213	47	195,156
January	51	229,516	55	246,266
December	57	292,419	62	302,713
November	68	278,207	73	306,493
October	72	293,569	68	277,041
September	46	203,192	47	203,236
August	62	258,910	63	263,569
July	64	259,303	62	252,021
June, 1929	48	199,237	56	233,867

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1930	255	703,361	263	699,493
February	263	715,681	237	630,673
January	252	706,945	260	715,903
December	273	772,310	279	785,160
November	268	736,452	269	739,461
October	244	681,983	261	713,490
September	257	684,203	260	698,665
August	272	726,363	273	721,024
July	279	712,324	288	741,716
June, 1929	277	708,089	273	711,898

Charleston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net. tonnage	—Clearances— No. ships	Net tonnage
February, 1930	20	52,660	18	44,494
January	25	61,031	22	58,857
December	16	42,198	19	46,455
November	24	62,691	27	75,588
October	24	62,345	25	65,733
September	19	52,795	12	32,870
August	17	37,818	15	29,341
July	11	21,622	10	20,558
June	15	42,166	12	26,501
May, 1929	15	33,550	15	33,826

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1930	24	31,987	82	235,656
February	26	48,200	68	197,140
January	30	77,176	87	274,299
December	27	65,306	104	358,823
November	28	68,030	108	332,315
October	36	88,056	118	385,367
September	47	131,512	101	323,955
August	37	87,502	74	275,017
July	36	72,793	87	259,450
June, 1929	35	75,614	78	243,391

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1930	211	682,547	218	677,011
February	177	580,092	165	542,392
January	185	601,710	176	596,007
December	212	619,119	178	589,551
November	225	676,209	215	664,661
September	259	621,704	225	605,808
August	204	583,568	185	554,520
July	203	705,042	169	620,250
June, 1929	186	574,459	159	582,247

San Francisco

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1930	179	710,763	150	631,782
February	142	565,514	135	567,268
January	158	644,015	149	630,336
December	182	632,677	148	558,136
November	161	620,878	143	579,803
October	179	696,620	164	667,367
September	151	563,770	134	559,772
August	196	723,330	168	669,499
July	173	680,770	153	621,762
June, 1929	167	643,580	147	584,361

Port Arthur

(Exclusive of Domestic)

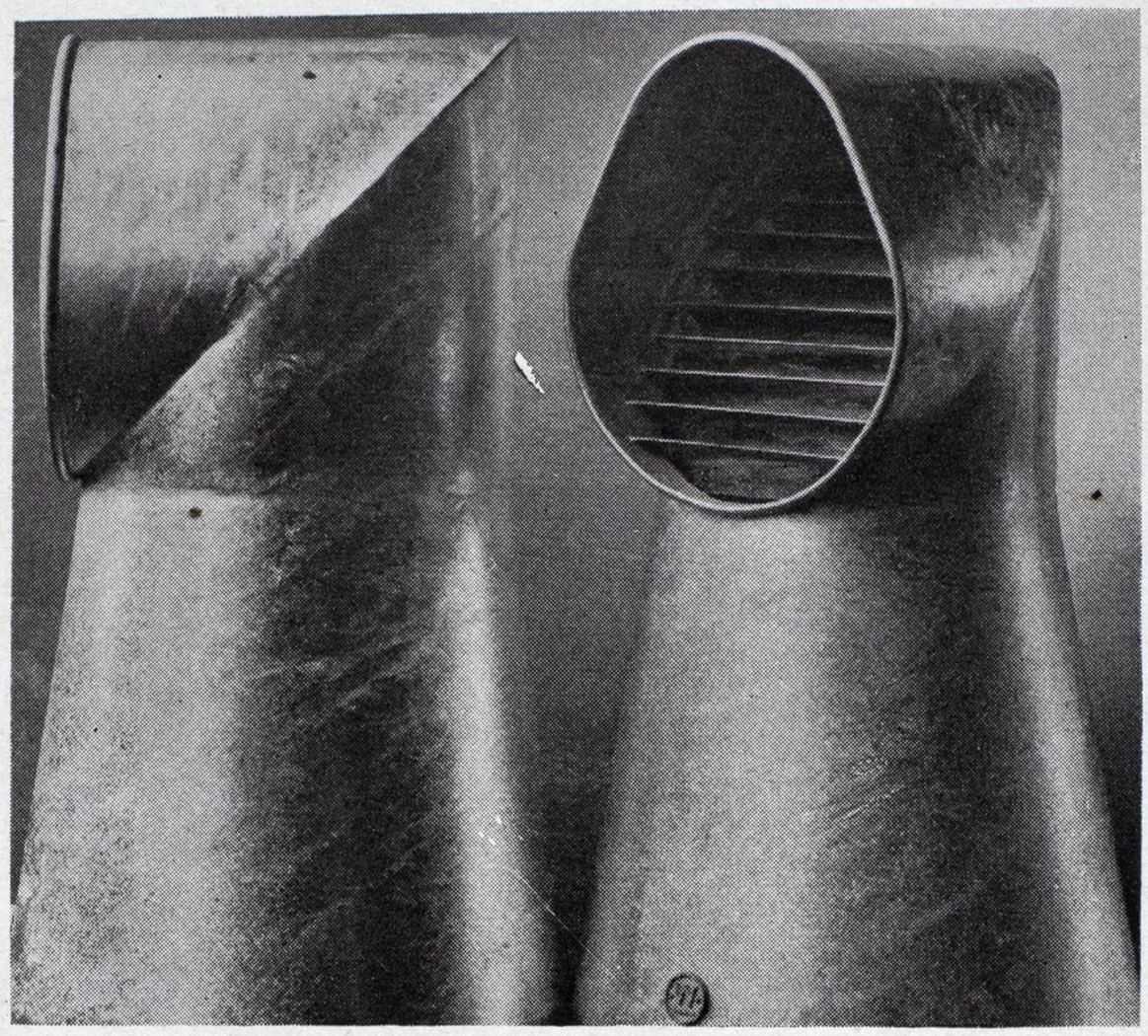
Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1930	19	58,652	24	65,593
February	16	46,488	16	43,414
January	15	42,725	23	69,678
December	21	60,843	20	57,783
November	22	76,862	21	66,067
October	13	45,041	20	58,624
September	21	71,932	21	74,402
August	21	76,420	24	76,700
July	16	58,233	20	71,457
June	23	88,857	26	91,114

Note: The figures given in this table are for direct entrances and clearances. Additional vessels in foreign trade enter and clear from and to other American ports after original entry and before final departure. At the port of Philadelphia, for instance, additional vessels in the foreign trade in this category were 63 of 221,361 net tons entered and 86 of 286,501 net tons cleared for the month of March.

Equipment Used Afloat, Ashore

Streamline Ventilator—Less Wind Resistance—Propeller Type Blower Efficient—Screw Type of Conveyor—Large Wheel Truck—Pressure Regulator

VENTILATORS on a ship's deck, the world over, look the same. A straight, vertical, cylindrical tube with a gracefully curved and enlarged top or opening known as a cowl, are so characteristic of a ship's ventilator that it would be recognized by any people in any port of the world. So strong is custom that it rather goes against the grain to change the appearance of so well established a piece of ship's equipment. But science can show no favors and a demonstration of inefficiency as compared with a totally different design will spell its doom no matter how long it has been used nor how familiar and pleasing to the eye it may seem.

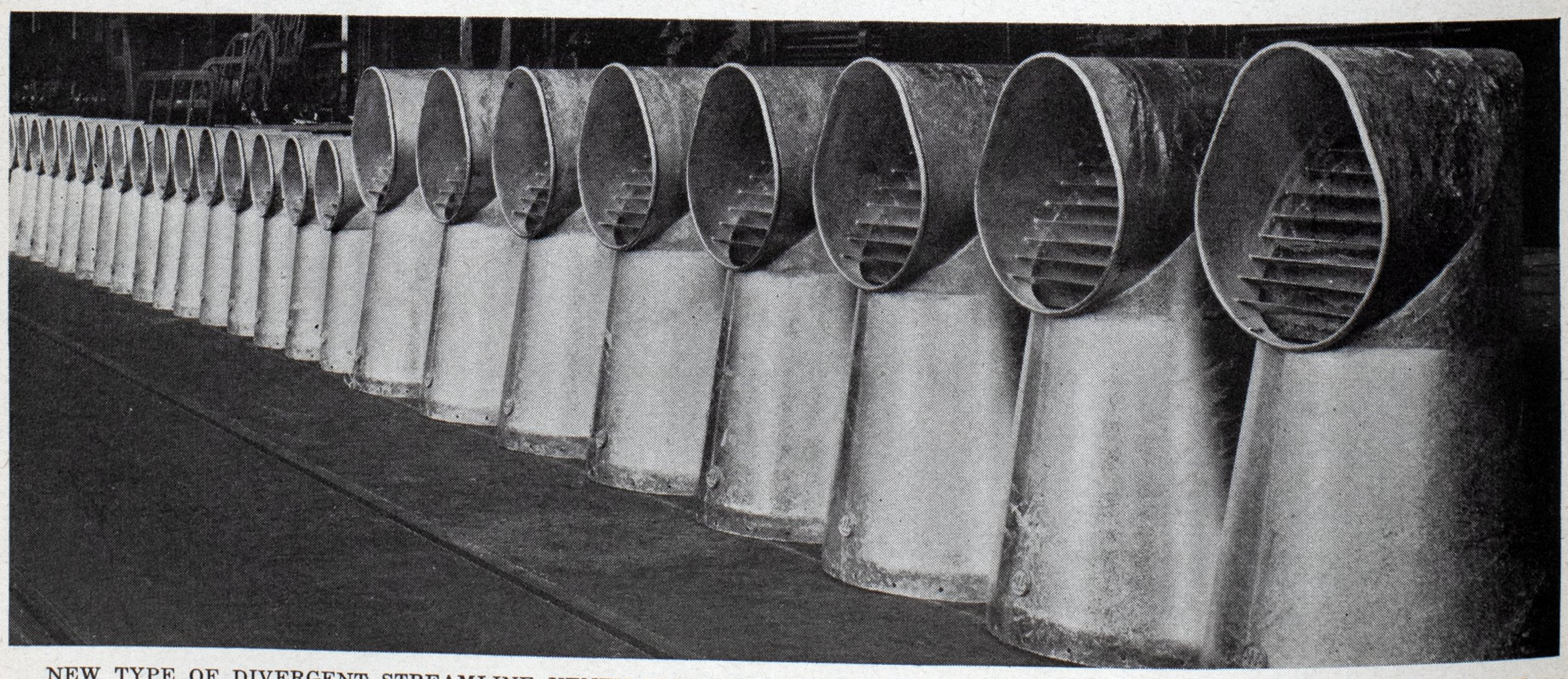


DIVERGENT STREAMLINE VENTILATOR COWLS OF 36-INCH SIZE

All this is true of the new ventilator cowls and louver vents recently developed by the Westinghouse Electric & Mfg. Co. The accompanying illustration shows one of these new ship's ventilators with a 36-inch cowl. The four new coast guard cutters, ITASCA, SEBAGO, SARANAC and SHOSHONE building at the General Engineering & Dry Dock Co., San Francisco, will have eight of these 36-inch cowls and sixteen 24-inch. Their efficiency apparently has been mathematically demonstrated beyond question.

The principle of this so called divergent streamline cowl is the same as for the Venturimeter. It is possible to convert kinetic into potential energy by means of a divergent tube air passage or as it is more commonly expressed to convert velocity into pressure. It has been demonstrated that if there were no friction and no pressure to overcome, the inlet area of a cowl would be the area of the pipe, whereas in the ordinary cowl the inlet is generally made twice the diameter of the pipe. It is obvious that if all the air which could be taken through this area, being four times that of the pipe, were forced through the pipe it would require a velocity of four times that of the wind blowing against the inlet. As the energy varies as the square of the velocity this would mean that the air current should acquire sixteen times the energy actually present in the wind. This of course, is impossible and as a matter of fact, since there is always pipe friction and a certain small static pressure in the space being ventilated by a cowl, it is necessary for part of the original velocity to be converted into static pressure. The energy, therefore, in the air passing through a pipe would be somewhat less per pound than that of the wind and therefore, needs less capacity than that indicated by the wind velocity and the cross sectional area of the pipe.

Experiments have shown that if the velocity head of the approaching air steam is utilized by converting part of its kinetic energy into pressure by using a diverging tube, that is one of increasing area, it is possible to so reduce the pressure at the entrance as to induce a velocity through the entrance of the cowl which may exceed even twice that of the wind causing the flow. Consequently, it is possible



NEW TYPE OF DIVERGENT STREAMLINE VENTILATORS FOR COAST GUARD CUTTERS—TEN—24-INCH AND EIGHT—36-INCH

to make the entrance of the cowl of smaller area than that of the duct or pipe to which it is attached.

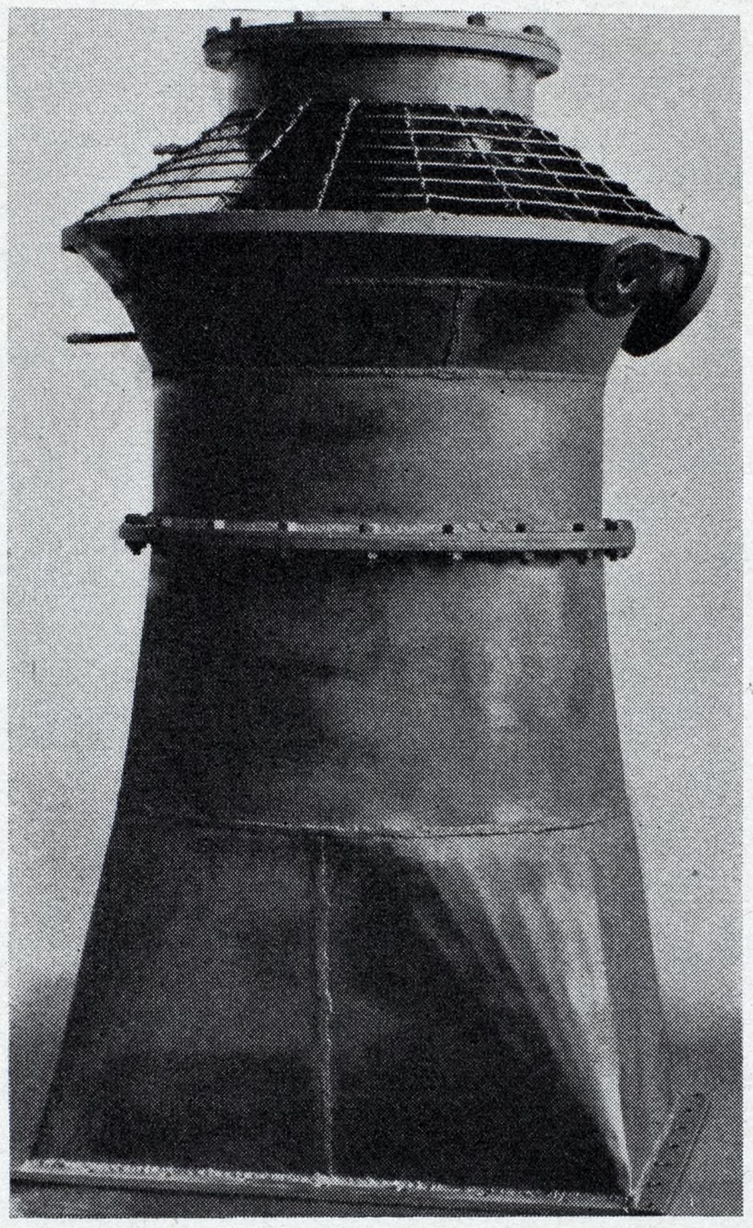
It was discovered many years ago in experiments with a wind tunnel in Germany, that the so-called bladed corner, consisting of thin sheet metal blades, greatly increased the efficiency in making a sharp right angle turn. Tests show that the bladed corner is more efficient than an ordinary long sweep elbow. Therefore, the Westinghouse divergent streamline ventilator cowl is merely the combination of two established principles which had not been combined for this purpose before. Another interesting feature is that the use of corner blades in this case makes these cowls stowaway proof.

An improvement in cowls came about through a general consideration of the wind resistance of ships structures in high speed vessels. A speed of 32½ knots is equivalent to 55 feet per second and as one horsepower is 550-foot pounds per second, it is obvious that at 32½ knots every ten pounds of wind resistance represents one tow rope horsepower. If the average propulsive coefficient of vessels is taken at 6, this means that every ten pounds of wind resistance represents 1.6 shaft horsepower, which must be developed by the main engine. The common design of ventilator cowl on high speed vessels therefore, represents an unnecessary loss. To reduce wind resistance of ventilators there should be a totally different design. In the ventilator described here, by using the Venturi principle the inlet area is reduced to one half the pipe area instead of four times the pipe area as is the case in the old cowls. The wind resistance has been still further reduced by making the cowl of streamline form so that it is safe to say that the wind resistance of the divergent streamline cowl is less than one fifth that of a standard cowl.

Because of the much smaller size not only the wind resistance but the weight and cost are also reduced. There is the further advantage that since the cowls do not have the large ball like entrance and elbow, they can be turned on their own diameter. This may be important as the overhanging bell like structure of the standard cowl might interfere with adjoining deck houses or other superstructure.

It must be borne in mind that the capacity of a specified size of the divergent streamline ventilator is substantially the same as that of a standard cowl, but that it has only a small fraction of the wind resistance. Its capacity is not greater than the standard cowl ventilator of the same duct diameter. Also, the divergent streamline cowl will not have as great a capacity when used for discharging air from a compartment as a standard cowl. It is not quite as suitable or as efficient as a standard cowl when employed as the inlet of a fan, although its wind resistance advantages are still superior.

Where a cowl is to be employed for exhausting from a compartment, it should be of the streamline form but with an outlet area, equal to the cross sectional area of the pipe to which it is connected; or preferably, it should be divergent in the reverse direction of the inlet cowl, that is, have a larger outlet area than the area of the pipe. This form is also suitable in cases where it is connected to a fan, where the cowl is to be employed for either



PROPELLER TYPE FORCED DRAFT BLOWER

discharging into or out of the same area as the connecting duct.

The divergent cowl was designed primarily for high speed vessels where wind resistance is of great importance, but they can also be employed to advantage even on slow speed vessels. The comparative performance of a standard cowl and the divergent cowl is independent of wind velocity.

There has also been developed by the Westinghouse company another form of discharge ventilator known as the pagoda louver vent, which is particularly well suited for discharge ducts connected to fans or blowers, so located so as not to be able to utilize the assistance of the wind. The pagoda louver vent reduces the friction of air leaving a duct under pressure as from a fan or blower. Its openings are scientifically designed and bladed to give even streamline flow without sudden sharp turns or eddies. As a result, the power required by the fan or blower to discharge a certain amount of air, is greatly reduced.

Propeller Type Makes an Efficient Blower

IN THE journal of the American Society of Naval Engineers for August, 1928 an article appeared by Joseph B. Lincoln and Burnett F. Treat on the Westinghouse forced draft blower of the Schmidt propeller type. This article described tests at the United States navy experimental station of a turbine driven propeller type, forced draft blower. The test results demonstrated qualities of reliability, simplicity, low weight and high efficiency. The particular blower tested was rated at 75,000 cubic feet per minute at 10-inch water static pressure.

The accompanying illustration shows a similar, though much smaller capacity, blower. It is turbine driven and the casing is of steel, all electric welded. It is a propeller type, forced draft, blower fan recently developed for tug boat fire rooms and it is rated at 8500 cubic feet per minute at 2½-inch water static pressure. The propeller is three-bladed and is driven by means of a steel shaft supported in grease lubricated (alemite system) ball bearings by single wheel turbine having inside buckets milled in the wheel.

Two units of this type have been installed in conjunction with enclosed furnace type of forced draft for scotch boilers. One blower has been placed in the Standard Transportation Co.'s new harbor tug SOCONY No. 4. The other has been installed in the new 900 horsepower tug boat DU BOIS II, recently completed for Henry Du Bois Sons Co. by the Staten Island plant of the United Dry Docks, Inc.

The blower shown in the illustration may be installed in a horizontal or vertical position or at any angle. It may be fitted with round, square or rectangular discharge duct. The blower and drive, as shown, has an actual weight of 300 pounds. When on test, these blowers impressed those who saw them by their freedom from objecttionable noise, frequently associated with blowers of this capacity and pressure.

The Hudson River Night line opened its hundredth season on April 1 with the sailing of the steamer RENSSELAER. The company plans a centennial celebration during the summer.

New Conveyor Suitable for Marine Service

A NEW portable flexible power-driven conveyor has been developed by the Clark Tructractor Co., Battle Creek, Mich., which is expected to find many applications in conveying, elevating and stacking cement,

STACKING SUGAR ON DOCK WITH CONVEYOR

coffee, sugar, lime, gypsum and other materials that are handled in bags, bales, bundles, crates and boxes.

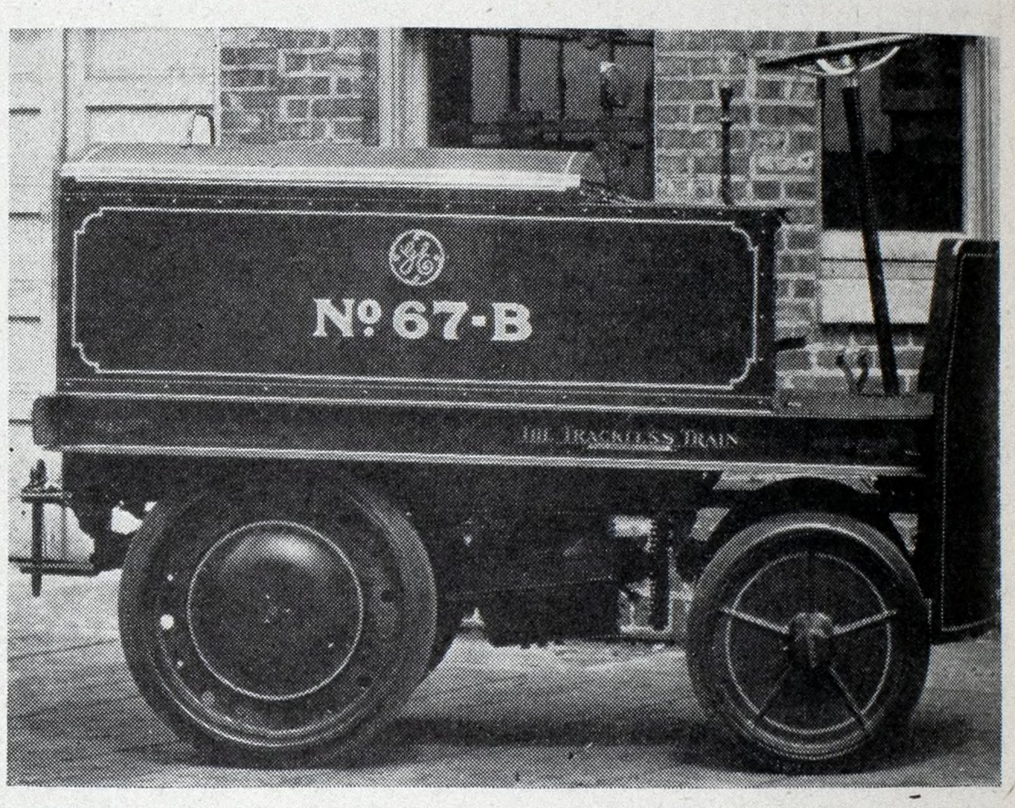
The new conveyor has been called a *twinveyor* and uses a new principle. Two tubular external screws are turned toward each other by a power head. Anything placed on the conveyor travels rapidly forward, perfectly balanced. The equipment has been used for some years in sugar refineries in California and Hawaii. There it has achieved remarkable cost reduction in handling the product. It carries bagged sugar up at 30 per cent grade at the rate of 90 feet per minute, handling 1800 bags per hour.

A standard unit consists of six 8-foot dual sections and a power head. Each section is light, joins to the assembly with an automatic lock. It is easily shifted about and the entire 50-foot line can be assembled or disassembled in six minutes. Flexibility is secured by the ability of any joint to take a 15 degree angle, horizontal or vertical. In the elevating operation, sections may be supported by the material that has already been stacked.

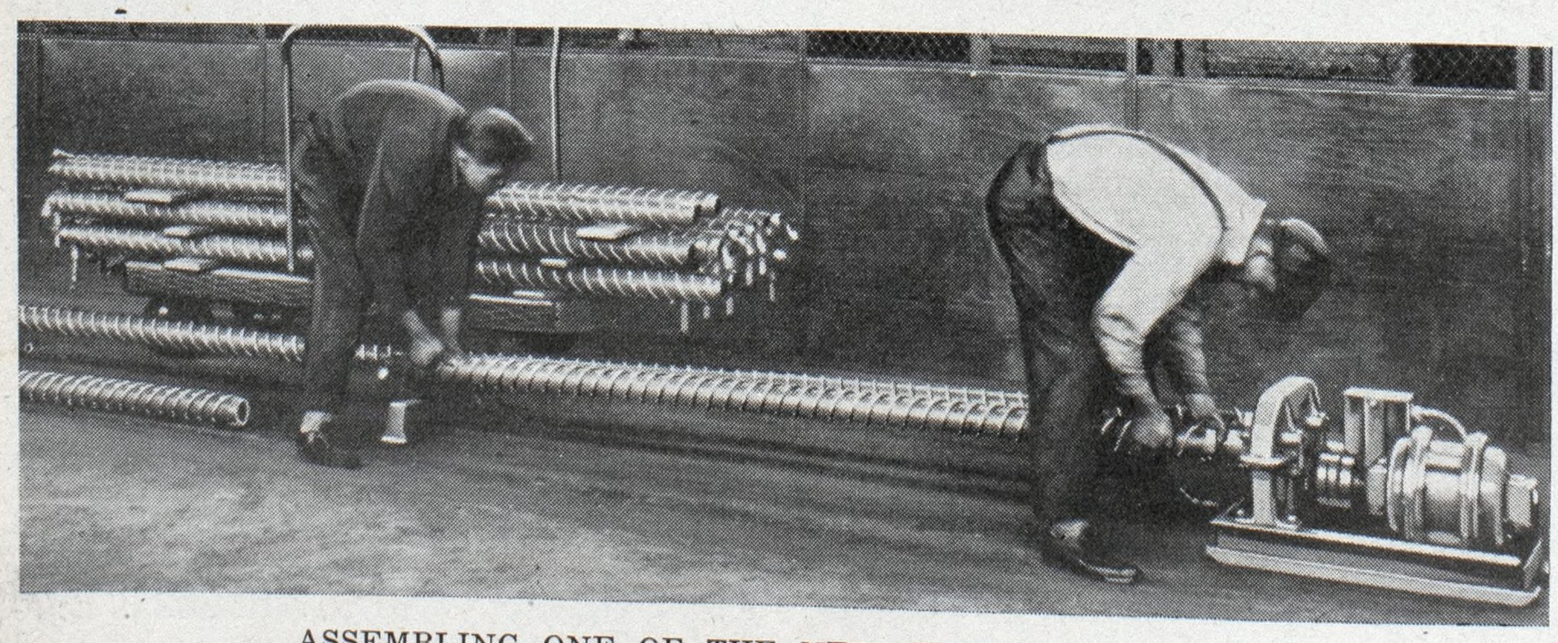
An extension cord attached to the power head may be plugged into any power line. The flow of power along the entire conveyor is smooth and constant. Two complete 50-foot conveyors of this type disassembled in 15 minutes, can be loaded on one trailer.

Large Wheel Tractor

THE Mercury Mfg. Co., Chicago has brought out a new type of electric tractor known as type C. The principle distinctive feature of this machine is its large wheels, which make it suitable for use outside as well as inside a plant. The rear wheels are 29 inches in diameter and the front wheels 24 inches in diameter. The front axle is so designed that the steering wheels turn at a very sharp angle, resulting in an outside turning radius of 92 inches. The tractor has an overall length of 90 inches, an overall height to the drivers seat of 55 inches, a wheel base of 49 inches and a tread front and rear of 36 inches. It is powered with a General Electric motor. The controller is of the full drum type and gives five speeds forward and five speeds reverse. The tractor weighs approximately 3200 pounds without a battery. The battery compartment will accommodate a thirty cell 23 plate Exide iron clad battery. The rated drawbar pull is 300 pounds. A piece of equipment of this kind would be particularly suited on a large pier where movements of cargo may be at some distance and would prove a large factor in saving time.



NEW TYPE ELECTRIC TRACTOR WITH LARGE WHEELS



ASSEMBLING ONE OF THE NEW TYPE OF CONVEYORS

A Removable Chain Link for Anchor Cable

DIFFICULTY has been experienced in end links and shackles of anchor chains passing over the wildcat of the windlass. A new patent detachable link made by the Baldt Anchor, Chain & Forge Corp., Chester, Pa., is the same length as the common links in the chain and may be used as a connecting link for joining various shots of chain by burning off the end links, or it may be carried as a spare link and used for repairing chains. It is made of 3½ per cent nickel steel, yielding strength of 125,000 pounds per square inch. The link is approved by American Bureau of Shipping and Lloyd's Register and is tested to the same proof and breaking strains as cast steel. It is a drop forging, the only machine work being the reaming of a hole for the taper or locking pin. The pin is sealed by a lead slug driven into the countersunk cap.

Woodworking Machine

A NEW all-purpose woodworking machine suitable for finishing the woodwork of the interior of vessels, has been placed on the market by the DeWalt Products Corp., Leola, Pa.

Operating on either direct or alternating current, this device is said to perform accurately and safely 29 distinct cutting operations including dadoing, routing, mitering, shaping, grooving, ploughing, rabeting, mortising, tenoning, gaining, etc.

With a 12-inch combination crosscut and rip saw which is standard equipment, the machine rips 2-inch stock at the rate of 20 lineal feet per minute. Fitted on a wooden table, the complete unit weighs 235 pounds. An adjustable guard is included in the equipment.

Two New Harbor Towboats

Two new harbor towboats are building at the yard of the William G. Abbott Shipbuilding Co., Boston for the Mystic Steamship Co., Boston.

These two new vessels, the VENUS and LUNA are 96 feet long overall, 24 feet molded breadth, and 11 feet draft. The vessels are to be diesel electric drive, powered with 650 horsepower Winton diesel engine, driving twin 325 horsepower engine generator units. The electrical apparatus is to be supplied by the General Electric Co., Schenectady, and the storage batteries by the Electric Storage Battery Co., Boston. Cutless rubber bearings are to be installed and are to be furnished by the Goodrich Rubber Co. The vessels are to be equipped with incandescent searchlights, electric refrigerators, electric steering gear, electric lighting.

John G. Alden, Boston, was the architect for the new vessels. The vessels are to be in service in Boston harbor around the middle of August.

Large Ship Insurance

British underwriters are engaged in calculating the insurance on the proposed new Cunard superliner, pointing out that since the EUROPA was insured for about £2,500,000 while under construction, the new Cunarder is likely to cost about £3,000,000. Every marine insurance market in the world is likely to be called upon to provide part of the coverage for the new liner when the big vessel is finally built.

Company Builds New Railway Dry Dock

By John Rushlow

FOLLOWING the discovery of Lake Champlain in 1609 by Samuel De Champlain that body of water has always figured prominently in American history. It was a point of conflict in the French and Indian wars, during the revolution, and in the War of 1812 because it was the connecting link between the St. Lawrence and the Hudson, and was very vital to inland commerce.

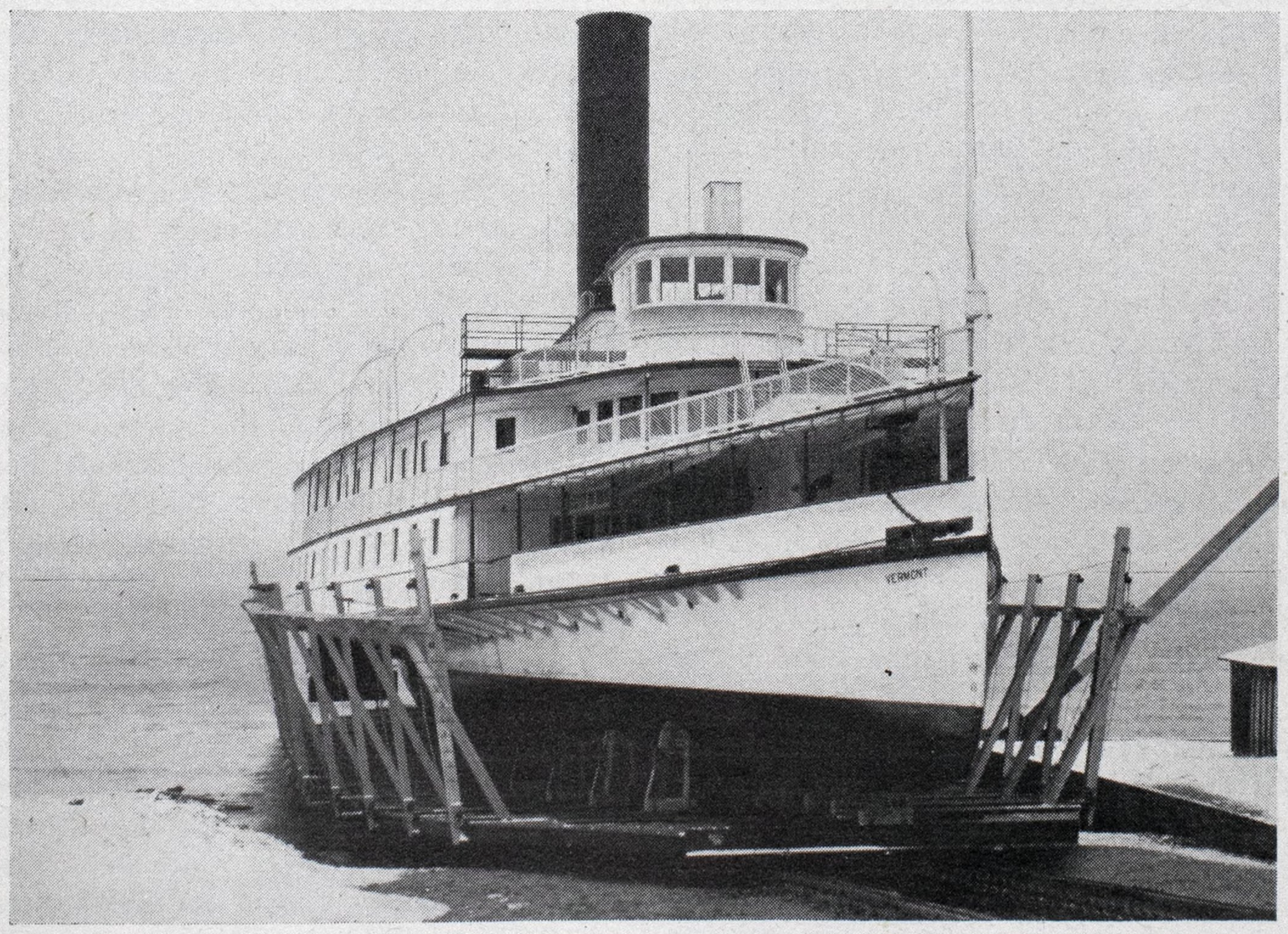
In 1808, a year after Robert Fulton's CLAREMONT made her successful trip down the Hudson, a steamboat was running on Lake Champlain, and in 1826, the Champlain Transportation Co. was chartered. This company is still operating steamers on Lake Champlain, and is the oldest steamboat company in America, with a long and successful record.

Soon after they received their charter the Champlain Transportation Co. organized their shipyard at Shelburne Harbor, about three miles from Burlington, Vermont, and that shipyard has been in operation since that time. At present the Champlain Transportation Co. operates three large steamers; the VERMONT 1100 tons, the TICONDEROGA 900 tons, and the CHATEAUGAY which weighs 600 tons. These steamers are all side wheelers, with beam engines, and Morgan feathering wheels. The steamer VERMONT is a through-line tourist steamer; the TICONDEROGA handles local service and excursion trips, and the CHATEAUGAY is an automobile ferry, operating between Burlington, Vt. and Port Kent, N. Y.

The company under the name of the Lake George Steamboat Co. operates three passenger steamers on Lake George, N. Y., the HORICON, the SAGAMORE and the MOHICAN.

Until they installed a modern marine railway last year, the hauling apparatus used at the Shelburne Harbor shipyard by the Champlain Transportation Co. had not been changed in over three years of a century, and hauling out a boat was a long, laborious and expensive process. The old method of hauling consisted of greased friction ways with bilge cradles. Preparing a cradle took about a week. Seven pairs of horses and 21 men were required on the slack capstans, and about eight or ten men to watch operations. The hauling gear consisted of 7.4 sheeve and 7.3 sheeve blocks. Seven sets of hauling lines 1200 feet long and two inches in diameter; rods, chains, bits, etc. Eighteen hours was considered good hauling time, and a hauling usually took from that to seven days. When a vessel was finally hauled out it took about four days to wedge it up, to get bilge cradles out, blocking and keel blocking in place for working conditions. The last cost of hauling and launching the steamer TICONDEROGA by the old method was $4000. On the Crandall Engineering Co.'s Railway Dry dock, the steamer VERMONT was hauled out in 39 minutes at a cost of $125.

This railway dry dock is constructed upon the site of the old greased ways at Shelburne Harbor. The tracks, of the two-way type, are laid down on a curved gradient which is an arc of a circle, the portion above water being of reinforced concrete and the underwater portion of wood, supported by wood piles. The cradle is 220 feet long over the keel blocks and 61 feet wide. It is decked over the full length for a width of 53 feet, and at the after end, the deck is extended 15 feet to facilitate repairs to rudders. There are 13 sliding bilge blocks.

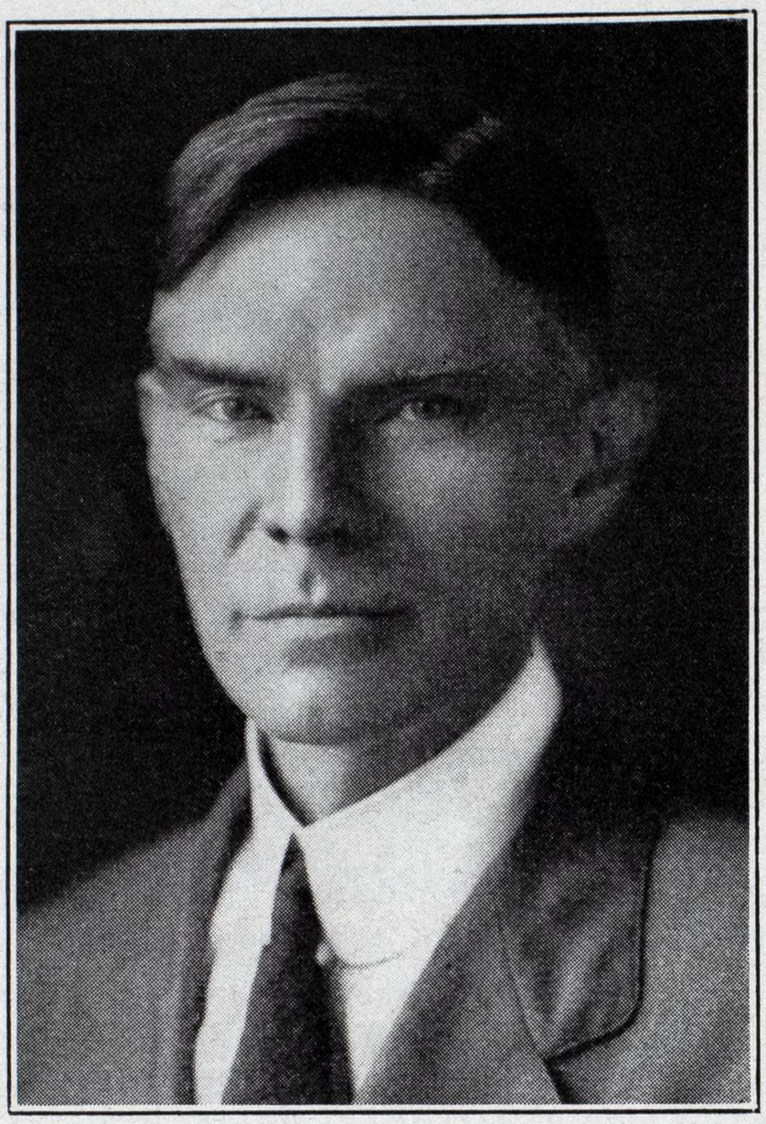


S. S. Vermont of the Lake Champlain Transportation Co. Hauled Out on New Railway Dry Dock Designed and Built by the Crandall Engineering Co., Boston

Personal Sketches of Marine Men

Henry F. Schmidt, Consulting Engineer, Westinghouse Electric & Mfg. Co.

By A. H. Jansson



HIS is the contribution of the inventor in putting to practical use some of the demonstrated principles of science.

HE HAS the ability to analyze a problem and then to outline clearly and simply steps leading to its solution.

MARINE engineering has been his special field of endeavor beginning with the first turbine installation using reduction gears.

RECOGNITION at their true value of the engineering achievements of any man is apt to be a slow process and is not likely to do him much good while he is on this earth. There are, of course, notable exceptions, but Henry F. Schmidt, consulting engineer for the Westinghouse Electric & Mfg. Co. is one of those brilliant engineers whose work and fame is still relatively unknown. Columbia university might look farther and fare worse in picking out one of her sons for deserved honors. To those who keep in contact with the progress of marine engineering he is known and recognized as an eminent engineer.

He is the only civilian who has twice won the American Society of Naval Engineers' prize for the best engineering essay. The first time was for the year 1927, with his paper *"Some Screw Propeller Experiments With Particular Reference to Pumps and Blowers,"* published in the journal of the society for February 1928. The second was for the year 1929 with his paper *"Theoretical and Experimental Study of Condenser Scoops,"* published in the journal of the society for February 1930. Both of these prize-winning articles demonstrate not only a very high order of engineering talent, but also a unique clarity in statement. The records of the patent office show that over 200 patents have been issued in his name. About 40 per cent of these patents have to do with inventions for marine use.

His work with Westinghouse has included researches in connection with the design of turbines, pumps, blowers, condensers, air ejectors, diesel engines, turbine governors and many other related subjects. Among his most widely known and used patents are the oil governor for turbines and the ejector lubricating system. So satisfactory have the results been that this equipment is now standard practice for his company. The work leading to the development of the oil governor included much new research work and this formed the nucleus of a series of articles which clearly and fully cover all of the essential features of fluid governors.

One of his most recent practical inventions is that of the divergent streamline ventilator, which incidentally shows the wide range of his technical interest. This ventilator combines two demonstrated principles, doing away with the wide cowl mouth and inserting blades or louvers in the throat of the ventilator, thus increasing efficiency, and materially reducing wind resistance at high ship speeds. Another of his recent proposals, reached after years of study, embodies the use of an efficient rotary type of bilge pump for maintaining ships afloat under seemingly impossible conditions. With this bold scheme realized, one might conceive an officer on the bridge pressing a button which would start an independent pumping system and keep the vessel afloat where under ordinary conditions she would go down within a few hours. Some of his calculations are said to have been based on the fact that it took the TITANIC some four and one-half hours to sink. Individual vertical rotary pumps each driven by an electric motor constitute the system.

Mr. Schmidt is a member of the United States Naval Institute, the American Society of Naval Engineers and the Society of Naval Architects and Marine Engineers. He was born in New York city and attended Columbia univeristy where he studied marine engineering under the late Prof. W. L. Cathcart. The original and independent quality of his mind was demonstrated while he was still a student. Entirely on his own, he began theoretical investigation of steam turbine design which resulted

in a simplified method of predicting turbine performance. The soundness of his youthful work is indicated by the fact that the Westinghouse company is at the present time using this method in modified form. After some years as an engineering lecturer in college and as an associate editor of an electrical paper, he joined the Westinghouse company in 1908 as assistant technical writer. As his unusual ability became recognized he served variously as turbine engineer, marine engineer and consultant.

Old timers will remember that the United States collier NEPTUNE represented the first real attempt to use high speed turbines and gears. The turbines were Westinghouse and the gears were Melville-McAlpine. He was intimately concerned with this vessel for the Westinghouse company and though it was not a perfect installation by any means, it was the boldest and most daring marine installation of its time and proved to be correct in principle and was therefore the forerunner of all the successful turbine reduction geared drives of the present day.

Those who know him best can best appreciate his remarkable mechanical ingenuity. He goes to the heart of any problem and apparently by the simplest steps. He will grasp quickly such literature as there is on any subject and then if it doesn't seem adequate or clear he will set up a theory of his own. and bide his time to prove it. Nobody, however, could be less self-assertive and the utmost simplicity in manner and thought is characteristic. He lives in Philadelphia and is attached to the South Philadelphia works of the company where turbines, condensers and auxiliaries are built.

Ask Bids on Two Mail Routes

ON MARCH 31 bids were opened by Assistant Postmaster General W. Irving Glover on two additional ocean mail routes. The first was route No. 35 from New Orleans to Rio de Janeiro, Buenos Aires, Montevideo and Bahia Blanca. Two bids were received, one from the Mississippi Ship Co., New Orleans, and the other from the Munson Steamship Co., New York.

The Tampa Interocean Steamship Co., New Orleans, was the only bidder on route No. 45 from New Orleans to West Mediterranean ports.

On route No. 35 the successful bidder will be required to make not less than 36 nor more than 52 trips per year with 10-knot ships. Four 13-knot ships are to be provided within two years and two additional ships within seven years.

On route No. 45, 32 trips will be required per year with 10-knot vessels. Two 15-knot ships are to be provided during the term of the contract. All contracts run for a period of ten years.

World Shipbuilding at New High Level

TOTAL world construction of merchant vessels is now in excess of the pre-war level of shipbuilding for the first time since the end of the post-war boom in production, in 1923, according to a statement of Lloyd's Register of Shipping, covering returns from all maritime countries for the quarter ended March 31.

In comparison with the 3,162,000 gross tons of merchant ships under way at the end of June, 1914, throughout the world, the present total shows a gain of over 100,000 tons. For the United States an increase of about 75,000 tons is shown. Great Britain and Ireland, however, are over 100,000 tons below the 1914 figure; but the other maritime nations, taken together, have made a gain of 136,000 tons.

An increase of 155,000 gross tons is shown for the quarter ending March 31, in contrast with the quarter ended Dec. 31, 1929. A comparison of conditions in the last two quarters is shown by Lloyd's Register, in the following table of gross tonnage:

	Mar. 31, '30	Dec. 31, '29
Great Britain & Ireland..	1,614,993	1,560,254
United States	222,974	179,062
Other Countries	1,427,962	1,371,564
World Total	**3,265,929**	**3,110,880**

World ship construction at this time last year, totaled 2,837,000 gross tons; 1,357,000 tons being built by Great Britain and Ireland; 96,000 tons by the United States, and 1,284,000 tons by the other countries.

New orders are more than replacing the work being pushed towards completion. During the quarter just ended, work was begun on nearly 200,000 gross tons more of steamers and motorships than the total of launchings in the three months. This contrasts with an excess of only about 145,000 tons of new work in the December quarter. And, in the quarter just ended, new construction in Great Britain and Ireland was 82,000 tons more than the launchings, and in the other countries, the margin in favor of new work was 112,000 tons.

How launchings and new work have compared in the last two quarters is shown by the following tables of gross tonnage for those periods:

Launchings

	Mar. 31, '30	Dec. 31, '29
Great Britain & Ireland..	343,760	472,683
Other countries	295,980	357,257
World Total	**639,740**	**829,940**

New Work

	Mar. 31, '30	Dec. 31, '29
Great Britain & Ireland..	425,987	495,990
Other countries	408,801	476,434
World Total	834,788	972,424

There is a sharp increase in the construction of steam and motor tankers of 1000 gross tons and upwards. During the December quarter the total for all countries showed an increase of over 225,000 gross tons, and there was a further increase of nearly 260,000 tons during the quarter just ended. For Great Britain and Ireland, the gain during the last quarter was 161,000 gross tons, and for the other countries taken together, 98,000 tons. How the pending construction of tankers has compared during the past two quarters is shown in the following tonnage table:

	Mar. 31, '30	Dec. 31, '29
Great Britain & Ireland..	558,778	397,559
Other Countries	328,106	230,197
World Total	**886,884**	**627,756**

During the March quarter, a marked advance was made in the tanker tonnage under way in the United States, the total of 28,700 gross tons under way at the end of December having now grown to 73,950 tons. For Germany, in the same period, there has been an advance from 74,445 gross tons to 84,745 tons.

Growing Trend to Motorships

A continuance of the growing trend towards motorship construction is shown by Lloyd's returns. Nearly 60 per cent of the entire world's merchant shipbuilding is now being devoted to vessels equipped with internal combustion engines. Nearly 200,000 gross tons more of these ships are now being built than at the beginning of this year; while in the same period, the construction of all other types of vessels combined showed a decrease. How the construction has compared in the last two quarters is shown by the following table of gross tonnage:

	Mar. 31, '30	Dec. 31, '29
Motor Vessels	1,931,362	1,737,834
Other Types	1,334,567	1,373,046
World Total	**3,265,929**	**3,110,880**

For the first time in their history, Great Britain and Ireland have more motorship tonnage building than that of all other types combined, the excess of motor vessels representing 138,000

gross tons. For the other maritime countries, taken as a group, motor vessels under way lead all other types taken together by nearly 460,000 tons. And, at present, 54 per cent of all British and Irish construction is to motor vessels, while for the other countries the proportion is 64 per cent. The comparison between the two groups of countries in types of ships being built is shown by Lloyd's in the following table of gross tonnage:

	Britain & Ireland	Other Countries
Motor Vessels	867,960	1,054,402
Other Types	738,033	596,534
Total	**1,614,993**	**1,650,936**

It is noticeable that while the United States is devoting only about 20 per cent of its merchant ship construction to motor vessels, practically every other country is giving the bulk of its building program to motorships. During the last quarter, however, declines were shown in the motorized construction under way in Holland, and Japan. All other countries reported show gains. The contrast between the last two quarters is shown by Lloyd's, in gross tons, as follows:

	Mar. 31, '30	Dec. 31, '29
Great Britain & Ireland	876,960	765,912
Holland	158,830	192,328
Japan	146,310	165,570
Germany	116,745	85,955
Sweden	109,760	87,260
Russia	106,788	100,595
France	98,390	76,725
Denmark	97,580	96,314
United States	46,269	42,990

Turbine and Diesel Show Gains

Figures covering the various types of marine engines being built or installed throughout the world, showed a decline in reciprocating steam engines during the March quarters; but a marked gain for steam turbines, and a smaller increase for oil engines.

For the diesel engine, the total indicated horsepower at the end of the March quarter was 1,559,955 indicated horsepower, as compared with 1,501,923 at the close of the December quarter. For Great Britain and Ireland there was a slight decrease, from 462,927 indicated horsepower to 457,932. Germany's total rose from 147,605 to 257,955; Denmark's from 185,785 to 209,285, and that of Switzerland from 103,120 to 106,950. Italy's aggregate fell from 112,440 to 103,500; Holland's from 122,946 to 100,996; Sweden's from 108,790 to 100,295, and that of the United States from 52,040 to 44,892.

For reciprocating steam engines, the total indicated horsepower for all countries, declined from 539,570 indicated horsepower to 506,227. For Great Britain and Ireland there was a drop from 369,725 indicated horsepower to 327,312; while the other countries combined showed an advance from 169,845 to 178,915. The United States has engines of this type, representing 13,500 indicated horsepower under way, as against 8000 in the previous quarter.

The world gain in the shaft horsepower of steam turbines during the past quarter was from 509,880 to 652,434. Of this latter total, the share of Great Britain and Ireland now is 321,469; of the United States, 118,500, and of France, 82,000—all showing gains over the figures of the previous quarter.

United States in Third Place

Although Great Britain and Ireland, and Germany still retain their positions as first and second in the volume of shipbuilding under way, the United States, during the quarter just ended, advanced from fifth place to third, and is now within striking distance of Germany, which has a lead of only eight thousand tons. Great Britain and Ireland, however, are doing just a shade less than 50 per cent of the world's shipbuilding, while the share of the United States is only about 7 per cent.

How the various countries have compared in volume of tonnage underway during the last two quarters is shown in the following gross tonnage table:

	Mar. 31, '30	Dec. 31, '29
Great Britain & Ireland	1,614,993	1,560,254
Germany	231,162	253,256
United States	222,974	179,062
France	182,930	167,177
Holland	178,683	231,934
Japan	167,055	183,570
Italy	144,358	77,919
Russia	122,598	121,069
Sweden	120,490	98,440
Denmark	109,414	104,589

Motorship Chichibu Maru

The second of the eight large new motor driven ships recently laid down by the N. Y. K. Line Japan Mail, the CHICHIBU MARU, arrived in San Francisco April 17 on her maiden voyage. She sailed again from Los Angeles on April 23 and from San Francisco on April 26 for Japan, China and the Philippines with stopover at Honolulu. She was preceded by the ASAMA MARU and will be followed by the TATSUTA MARU. Swiftness, modernism and expansions, make the new CHICHIBU MARU, the most recent of the huge $60,000,000 building program undertaken by the N. Y. K. Line Japan Mail, one of the most luxurious and modern vessels afloat.

The CHICHIBU MARU made more than 21 knots on her trial trip. Her sistership, the ASAMA MARU, cut 24 hours from the trans-Pacific schedule and continues to do so. Since the new liner is equipped with diesel engines, more powerful than those of her sister-ships, it is confidently expected that she will set new records in the California-Orient run

Ship Construction Using Isherwood Design

Year by year the list of ships grows for which Isherwood construction has been used. From September, 1907, to December, 1908, six vessels of a total of 31,608 tons deadweight capacity were built on the original Isherwood system of construction. At the end of 1929 this number had grown to a total of 1779 vessels of a total deadweight carrying capacity of 14,936,800 tons. The year 1929 shows the largest addition to the list of Isherwood ships since 1920.

For oil tankers the bracketless system of construction developed by Isherwood has now become practically universal where the longitudinal system is adopted. No less than 59 ships representing a total deadweight carrying capacity of 522,940 tons have been contracted for on the bracketless system of construction during 1929. The regular Isherwood system of longitudinal construction has also undergone several important changes to meet the conditions of modern ship design. This is now known as the Isherwood combination system and combines the usual longitudinal construction with the ordinary system of transverse construction. A number of cargo ships and oil tankers laid down during 1929 are being built to this combination system. It is becoming more general for cargo vessels.

Included in the total of vessels placed under this company's system of construction during 1929 are nine diesel tankers of 480 feet in length by 65 feet 9 inches in beam by 37 feet deep, each carrying 13,400 tons deadweight. These vessels are under construction by the Sun Shipbuilding Co., Chester, Pa., for the Standard Transportation Co., Tidewater Oil Co. and Motor Tankship Corp. Two large tankers for the Standard Shipping Co. are also being built to the bracketless system at the Federal Shipbuilding Co. These two tankers are somewhat novel in design, in that they will be propelled by high pressure steam turbines with steam to be furnished by water tube boilers of 400 pounds per square inch pressure and with superheat.

Among the other interesting vessels built on this system of construction delivered during 1929 is the whaler KOSMOS, said to be the largest whaling vessel afloat. She is 554 feet 1 inch in length by 77 feet 2½ inches in beam and 49 feet 7 inches deep. The KOSMOS is fitted with quadruple expansion engines and both hull and engines were built by Workman Clark & Co. Ltd., Belfast.

Circulation in Boilers

(*Continued from Page* 35)

changed in one particular from former practice. The fire was built at the back ends of the grates, using the same amount for coal and draft as in customary practice. The results are shown in the accompanying chart No. 6. Steam of 100 pounds pressure or 350 degrees temperature was raised in four hours. This was at 4 a.m. and one hour and thirty-five minutes before arrival in port requiring the fires to be checked. On arrival the top temperature had risen slightly and the boiler was cut in.

At this time the bottom line had made a definite upward start, but due to the layover and checking of fires fell back a few degrees. The layover lasted about two and one half hours and shortly thereafter, due to resumption of operations, the bottom line rose and joined the top line. This indicated complete circulation and the same approximate temperatures at top and bottom, which was continued to the end of the test, ten hours later, including a three and one half hour layover and balance in operation. A continuation of the rising line as made at that time is shown on chart No. 6 by a broken line, constructed at the same rate as it actually occurred later. It reaches the upper line at 6:00 p.m. showing the probable firing up and complete circulation in six hours, two hours of which the fires were checked.

The boiler equipment of this ship is ample so that for the greater part of the year three boilers easily and economically carry the load, and after a washout or minor repair made during operation, it is more convenient to cut in or change off boilers during a layover between trips.

This completed the first series of tests and the results were studied as this was the first experiment of its kind from our record, and a new field of experience for those concerned. It was then deemed desirable to make tests avoiding interference of layovers in determining the time elapsed in obtaining full circulation; also to shorten the firing up period comparative with that of water tube boilers, inasmuch as this boiler now had demonstrated a complete cycle of circulation, actuated by the same principal as that in water tube boilers; namely, thermo-syphonic, as demonstrated also in over 5700 locomotive boilers, equipped with Nicholson thermic syphons since 1918.

Thermo-syphonic circulation may be explained as follows: A cubic foot of water at the temperature of 200 pounds steam pressure, but before vaporization, weighs about 54 pounds. Assuming that ten per cent of the water content of the circulators is evaporated by heat transfer from the combustion chambers, the remaining nine tenths of each cubic foot weighs 48.6 pounds, the other one tenth is now in the form of steam, which at 200 pounds weighs .468 pounds per cubic foot or .0468 pounds for one tenth of a cubic foot. This makes a total weight for each cubic foot of mixed water and steam in the circulators of 48.6468 pounds. The solid water outside of the circulators, even with a complete cycle of circulation at the temperatures as shown by these charts, is 54 pounds per cubic foot and it is clear that its greater weight will displace the mixed water and steam of lighter weight, throughout the cycle of steam raising and later production in operation of the boiler, and in layovers under steam.

As all of the water entering the circulators comes from below, all of the boiler water is thus circulated, and if we may assume the evaporation rate of the combustion chamber heating surface at the conservative rate of ten pounds per square foot per hour; for that enclosed within the circulators, it will circulate 100,000 pounds per hour, putting all the water in this boiler through the circulators twice each hour.

Steam Raised in Three Hours

Tests were resumed during the second week of December, 1929. Chart No. 7 was taken with the boiler as left after taking Chart No. 6 two weeks before, the boiler remaining in service in the meanwhile. The weather was colder but the water was smooth and gave fine lines on the chart, as shown by the first trip, prior to the cooling down and filling with hotwell water at 145 degrees which lost five degrees due to a colder boiler room. The usual practice of firing was used as no directions were given except to observe that with the circulation they now had in this boiler, firing up could now be safely done in three hours, basing this on two hours or less for water tube boilers, but with less water to handle.

Steam was raised and the boiler was cut in exactly in that time. The firing up had been delayed until 11:00 p.m. expecting to be in operation at the time of cutting in, but a snow storm made some difficulty in finding the port, thus delaying the layover from 19 minutes past the time of cutting in. This likewise delayed the circulation reaching the bottom thermometer bulb, which responded about an hour after cutting in during the layover. Its temperature rose 200 degrees in about 15 minutes, about the same rates as on charts 5 and 6, and gave fine combined lines on the final trip.

It was then desired to have a record of performance with the circulator and with the down feed pipes again connected to, compared with the previous records. The boiler was cooled down and opened for observation, washing and re-connecting the down feed pipes. Filling was done with hotwell water tempered to 100-110 degrees, same as on chart No. 3, taken following the disconnection of the pipe. The weather was cold and rougher, with considerable rolling of the ship. The firing method followed was with an hour of dead slow fire, to thoroughly equalize temperature conditions throughout the boiler, and because of 50 degrees colder feed than on preceding test, and was accomplished and the boiler cut in during operation in four hours as shown in the accompanying illustration, chart No. 8. The bottom water dropped a few degrees during these hours, but started to rise a half an hour before cutting in and in 15 minutes more the pump was started but evidently was not furnishing water as hot as the circulation was providing, but checked the speed of rising of the bottom line. It did, however, join the upper line in three quarters of an hour, and without the wavering and drops in temperature noticed before the circulator application. There was a fire cleaning during the layover. The mussy lines of the final trips were due to slow running through ice fields in Green Bay, with reduced hotwell water temperature, colder water was shot into the bottom by the down feed pipe, but it was picked up by the circulation so as not to accumulate and affect the temperature of the bottom water and structure more than an average of five degrees. What looks like a bad record is really one of fine performance of a complete cycle of circulation under difficult conditions of operation.

The facts as set forth and the sustaining records of the thermometers prove the fact of syphonic circulation, as there would be no gravity circulation with water of equal temperature and density throughout its depth. Syphonic circulation is automatic, positive, foolproof, working coincidentally with heat transfer, whether in firing up, operation or layover under steam. Its means are self-contained within the boiler avoiding the complication, care and expense of external means to that end. Complete water circulation is of value in equalizing temperature stresses in the boiler structure.

Up and Down the Great Lakes

Suggest Extension of Ship Wireless Act—Lake Levels—Look for Good Year—Rivers and Harbor Work—Protest Admendment

DUE to the considerable disasters on Lake Michigan last fall, Senator Arthur H. Vandenberg, of Michigan, is discussing the advisability of extending the ship wireless act to include freight vessels on the Great Lakes. The secretary of commerce referred this matter to Dickerson N. Hoover, supervising inspector general of the United States Steamboat Inspection service. He called a conference of lake shipping interests on April 2, which was attended by every character of lake trade.

At this conference it was developed that 227 vessels on the Great Lakes were already equipped with radio telegraph while under the present law only 15 of these vessels were required to be so equipped and of these 15, only 3 came within the law throughout the season, the balance only coming within the law occasionally when they were in certain trades. All of the remaining 227 vessels had been voluntarily equipped with wireless by the lake operators. This represents a much greater percentage so equipped than for vessels trading on salt water.

A committee representing the various departments of the government concerned, acting jointly with a committee representing the various lake trades will give the matter further study with the view of reporting to the secretary of commerce.

The lake owners' committee was selected at a general meeting of lake interests held in Cleveland April 11. The personnel of this committee is as follows: George A. Marr, chairman; Fred L. Leckie, representing the passenger steamers; F. W. Ohlemacher, representing sand and gravel carriers; A. H. Ferbert, representing the bulk freighters; O. T. Larson, representing carferries; and Frank J. Peterson, representing the independent vessel owners.

The present wireless act applies to vessels carrying 50 or more persons including crew and on runs exceeding 200 miles from port to port. That is, all vessels coming within this category must, according to the present law, carry a wireless.

The second of the two new turbine electric carferries for the Pere Marquette railroad, built by the Manitowoc Shipbuilding Corp., the CITY OF FLINT 32, made a record breaking crossing of Lake Michigan early in April. The new carferry covered the run in 3 hours and 7 minutes from the pier at Ludington, Mich., to the pier at Manitowoc, Wis. This distance is said to be 65 miles and the speed in miles per hour is 20.86.

March Lake Levels

The United States lake survey reports the monthly mean stages of the Great Lakes for the month of March as follows:

Lakes	Feet above mean sea level
Superior	602.10
Michigan-Huron	580.70
St. Clair	576.05
Erie	573.53
Ontario	247.66

Lake Superior was 0.09-foot lower than in February and it was 0.36-foot lower than the high March stage of a year ago. Lakes Michigan-Huron were 0.12-foot higher than in February and they were 0.06-foot higher than the March stage of a year ago. Lake Erie was 0.31-foot higher than in February and it was 1.01 feet higher than the March stage of a year ago, 2.27 feet above the average stage of March of the last ten years. Lake Ontario was 0.61-foot higher than in February and it was 1.51 feet higher than the March stage of a year ago, 2.39 feet above the average stage of March of the last ten years.

Expect Good Season

Lake carriers report a satisfactory outlook for Great Lakes shipping this season as a result of the preliminary business booked thus far. According to leading transportation representatives, as much business to start the season may be expected this year as last. With the navigation season actually under way, further improvement is expected.

Large accumulation and slow diminution of ice on Lake Michigan, Lake Superior and Lake Huron, which condition affected Chicago trade, gave indication early last month that the season might be shortened this year. Conditions have been clearing rapidly, however, and ice fields disappearing.

Predictions by several of the Great Lakes passenger lines are that the summer's tourist trade should exceed last year. Michigan Transit Corp. already has placed an unusual volume of bookings for the season, including conventions and outing groups. Goodrich Transit Co., with a fleet of passenger boats in operation throughout the winter, expects to put on four excursion boats about the middle of next month. Most of the line's eight combination freight and passenger vessels also are expected to be operating at about that time. Great Lakes Transit Corp., operating 19 freighters and three passenger boats, reports its agents expecting a heavy freight tonnage season.

River and Harbor Work

In the recommendations of Secretary of War Hurley for allotments totaling $12,000,000 for river and harbor work is contained an item of $395,000 for the Milwaukee harbor. It was recommended also that $600,000 be made available for the Illinois river, and $2,700,000 for maintenance work on the Missouri river. Of the latter amount, $2,200,000 has been allotted for the work from Kansas City to the mouth of the river.

The $12,000,000 appropriation was included in the first deficiency bill signed March 26 by President Hoover, and contained funds for inland waterway development throughout the country. Other allotments included Marquette harbor, Michigan, $8000; Keweenaw waterway, Michigan, $18,000; Ontonagon harbor, Michigan, $30,000; harbor at Duluth and Superior, Wis., $15,000; Fox river, Wisconsin, $60,000; Frankport harbor, Michigan, $258,000; Muskegon harbor, Michigan, $815,000; Waukegan, Ill., harbor, $80,000; Chicago harbor, $30,000; Michigan City harbor, Indiana, $138,000; Saginaw river, Michigan, $15,000; Channels in Lake St. Clair, Michigan, $30,000; and St. Clair river, Michigan, $10,000.

Funeral services for Captain Coydon H. Woodford, for over 20 years active in the Interlake Steamship company's fleet, were held the afternoon of March 27 from the Union Church on Catawba Island.

Launch Big Freighter at Toledo Yard

THE second bulk freighter, building for the Pittsburgh Steamship Co., the THOMAS W. LAMONT, was launched March 22 at the yard of the Toledo Shipbuilding Co., Toledo, O. Miss Virginia Strom, daughter of H. C. Strom, traffic manager for the Pittsburgh Steamship Co., acted as sponsor for the new vessel. Thousands of people witnessed the ceremony.

The THOMAS W. LAMONT is 604 feet long overall, has a 60-foot beam and a depth of 32 feet. She is equipped with three Scotch boilers and triple expansion steam engine of 2200-horsepower. Her carrying capacity is about 13,500 tons. The equipment of the new vessel is of the most modern type. The THOMAS W. LAMONT is the second big freighter to be brought out this year by the Pittsburgh Steamship Co.

The EUGENE P. THOMAS was launched March 8 at the River Rouge yard of the Great Lakes Engineering Works. Captain Fred H. Mallory is master of the THOMAS W. LAMONT. Captain Mallory has been with the Pittsburgh Steamship Co. for 22 years and during that time was master of the GEORGE W. PERKINS, PETER A. B. WIDENER, WM. E. DIXON and recently was master of the flag ship of the fleet, the JAMES A. FARRELL.

Company Changes Name

The name of the Becker Steamship Co. of Cleveland has been changed to the Midland Steamship Co. There is, however, no other change either in the officials or the management. Carmi A. Thompson remains chairman of the board, Baird Tewksbury continues as president and treasurer, and Patrick Butler remains as vice president and secretary. Capt. J. J. Freitus is fleet manager.

To Remodel Freighter

A contract has been let to the Buffalo Marine Construction Corp. for remodeling the package freighter, F. B. UNDERWOOD, of the Great Lakes Transit Corp. fleet, according to an announcement made by William Flaherty, superintendent of the corporation. The vessel is to be remodeled in order that it may carry long lines of pipes, structural steel reinforcements for concrete, boilers, engines, large pieces of machinery, news print and forgings. The remodeling is to be carried out so that the ship may be reconverted to a package freighter within a short time. Based on the specifications, the No. 1 and No. 9 hatches are to remain the same, the other hatches to be changed into two large ones of the salt water type with the coaming three feet above the deck. Each of the new hatches is to be 56 x 27 feet. 'Tween deck hatches are to be cut to the same size as those on the upper deck. Two cranes are to be installed between the two large hatches and are to have a lifting capacity of from 4 to 25 tons, based on the radius of the boom. Each crane will be able to operate on a long radius, thus enabling the boat to handle extra length pipe and steel.

Bulk Freight Fleet Drops

According to the annual compilation released April 18 by the M. A. Hanna Co., 19,100 tons ship capacity was lost to the Great Lakes bulk freight fleets during the past year through various causes. The automobile trade took two of the freighters, two were converted into self-unloaders, two were sold to Canadian interests and one went into the sulphite trade. The ship capacity of the seven ships was given as 41,700 tons. Two new ships have been added to the bulk freight fleet this year by the Pittsburgh Steamship Co. These new vessels, the THOMAS W. LAMONT and the EUGENE P. THOMAS, have a total ship capacity of 24,000 tons. A total of 335 ships are now in the bulk freight trade and have a ship capacity of 2,807,900 tons.

Company Increases Fleet

Through purchase of the steamer, H. F. BLACK, from the Donner Steamship Co. of Buffalo, the Cleveland-Cliffs Iron Co.'s fleet will have an addition of one boat for the coming season.

The H. F. BLACK is a steel vessel vessel with a 504-foot length at keel, a 54-foot beam and a depth of 30 feet. Her capacity is 9500 tons. The fleet of the Cleveland-Cliffs Iron Co. now totals 22 ships.

According to an announcement by the Lake Carriers association on April 19 a number of students in the schools of the Lake Carriers association successfully passed their examinations before the steamboat inspection service for original licenses or for a raise in grade. These students have been in attendance at the school of navigation in marine engineering conducted by the Lake Carriers association during the winter. One class is held in Cleveland and the other at Marine City, Mich.

Protest Amendment to Seaman's Law

QUITE a stir has been aroused not only on the Great Lakes, but among coastwise owners and operators in protest against the enactment of LaFollette bill 6306 introduced by the junior senator from Wisconsin. This bill, though it contains a number of other provisions, provides principally for the establishment of shipping commissioners for coastwise and Great Lakes trade. Hearings were begun on April 14, before the sub-committee of the senate committee on commerce to which this bill had been referred.

The bill contains a number of other features which in the opinion of shipping men are of exceedingly drastic and harmful character. Enactment of this bill has been protested by chambers of commerce, manufacturing and industrial concerns as well as vessel owners and others who feel that the commerce of the Great Lakes will be seriously handicapped if it becomes law.

Representatives of the Lake Carriers' association, headed by Newton D. Baker, general counsel attended the hearing in Washington, April 14 and 15. Those with Mr. Baker were George A. Marr, vice president and secretary of the Lake Carriers' association; A. E. R. Schneider; George M. Steinbrenner; Capt. R. W. England; Alex T. Wood; Capt. Ralph J. Lyons and Capt. Edward Fitch.

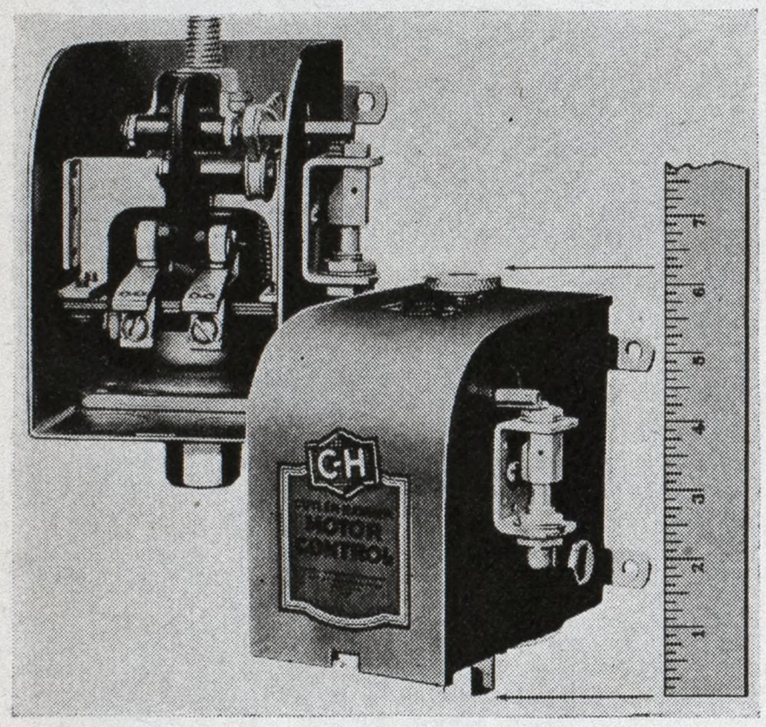
The inland passenger lines were represented by Fred L. Leckie, secretary of that organization accompanied by C. L. Perkins, general manager, Detroit & Cleveland Navigation Co. and Capt. Fred J. Simpson, manager of the Detroit & Windsor Ferry Co. Others attending the hearing were Hubert B. Fuller, representing Cleveland chamber of commerce; Captains Thomas H. Saunders and Alex Craigie representing International Ship Masters association; also representatives of the Maritime association of New York; Tugboat Owners association of New York; sea service bureau of the United States shipping board; Pacific Coast Steamship Owners association; and the United States chamber of commerce. All of these organizations, directly affected by the provisions of the LaFollette amendment to the seamen's act, were protesting the passage of this amendment as vigorously as they could.

On April 4, R. C. Allen, first vice president of Oglebay, Norton & Co., was elected president of the Lake Superior Iron Ore association, succeeding Col. F. B. Richards, who resigned.

New Small Pressure Regulator for Fluids

A NEW single pole pressure regulator, exceptionally small in size, is announced by Cutler-Hammer, Inc., 175-12th street, Milwaukee, Wis. This new device, known as Bulletin 10006, can be used as a starting switch for motors up to one horsepower, 230 volts, A. C. or D. C., or as a pilot switch in the control circuit of automatic starters for larger motors. The regulator closes the circuit at low pressure and opens it at high pressure and can be adjusted to open the circuit at any pressure from 30 to 200 pounds.

It can be used for maintaining pressure on systems containing water, air, gas and other similar fluids. For air compressor service, a small unloader device at the side of the case removes back pressure.



SINGLE POLE PRESSURE REGULATOR

To withstand moist atmospheres, the enclosing case is black japanned and metal working parts are cadmium plated. Double-break silver contacts prevent pitting and insure good contact. The diaphragm is of rubber. Conduit knockout holes in the case facilitate wiring.

Boiler Concentration Shown at a Glance

MAINTAINING boiler water in proper condition is one problem of steam-driven boats, whether in salt or fresh water. Where the water is recirculated as with ocean-going vessels, it is very important to watch the concentration of the boiler water, to protect the boiler, to prevent needless loss of fuel from unnecessary blow-down and also to prevent waste from unnecessary water treatment.

The concentrometer recently brought out by the Elgin Softener Corp., Elgin, Ill., enables one to obtain boiler concentration at a glance, directly in grains per U. S. gallon. This simple device, which weighs less than six pounds, is a combination hydrometer and thermometer. A sample of the boiler water is placed in the sample jar. The concentrometer is then placed in the liquid and indicates directly in grains per U. S. gallon, the actual concentration.

Anyone who can read a gage glass or water column, can use the concentrometer. By using this device, it is possible to save fuel and make boiler water safe. Blow-down becomes economical. Boilers are free from the dangers of caustic embrittlement while foaming and priming are eliminated.

Develop Truck Battery

THE Electric Storage Battery Co. Philadelphia has developed a new battery for industrial truck service called the T L Exide iron clad battery. This battery has the same horizontal dimensions for a cell of the same number of plates, as the familiar M V A Type, but the new battery is five and one half inches higher. This additional height results in an increase in the capacity of the T L type of 47 per cent greater ampere hours than the M V A and 43 per cent more kilowatt hour capacity. The advantage of the T L type over the M V A is that the battery capacity of an electric truck can increase by these amounts without increasing the length and width of the truck, thereby prolonging the number of hours of operation before recharging is necessary.

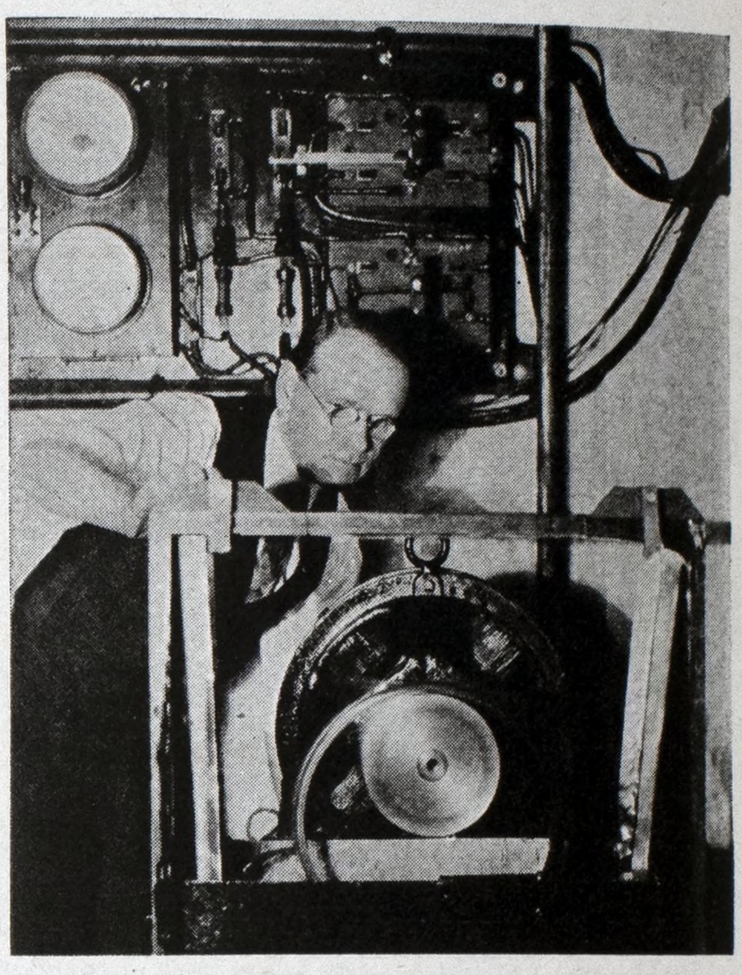
Hand Truck Trailers

THE Eastern Steamship Co. has extended the use of hand trucks by equipping them with a device which makes possible using them as trailers. This device is a bar of steel extending from the truck in front and hooking to the one in back. It is shown in the accompanying illustration. The hand trucks are made up into trains of trailers and are hauled by an electric or a gasoline tractor. Freight is received direct on to the hand trucks and kept there until loading begins.

HOOKING HAND TRUCKS TOGETHER MAKING A TRAIN OF TRAILERS

Testing Oil Rings by a New Method

THIS electric motor oil ring test machine is glass enclosed to prevent spattering. The research laboratories of the Westinghouse Electric and Mfg. Co. are carrying on this work as part of the first scientific investigation to determine the most effective size, shape and weight of oil rings for maximum lubrication.



ELECTRIC MOTOR OIL RING TEST MACHINE ENCLOSED IN GLASS

New Scrubbing Machine for Ship Decks

A SCRUBBING and polishing machine suitable for use on board ship for scrubbing and polishing decks has been placed on the market by Finnell System, Inc., New York.

The frame of the machine is heavy pressed steel, plated with a rust-resisting finish. Timken tapered roller bearings are used throughout in the construction of the machine. A rubber bumper protects coamings, etc., from marks where the machine might come in contact. Having a low head over the brushes, it may be freely operated under obstrutcions.

The brush ring is 18 inches in diameter and operates at a speed of 175 revolutions per minute. There is ample weight on the brushes to take care of all requirements of the ship's deck-cleaning problems. A sturdy General Electric half-horsepower motor provides the energizing force and is so housed that the water used in scrubbing cannot reach it.

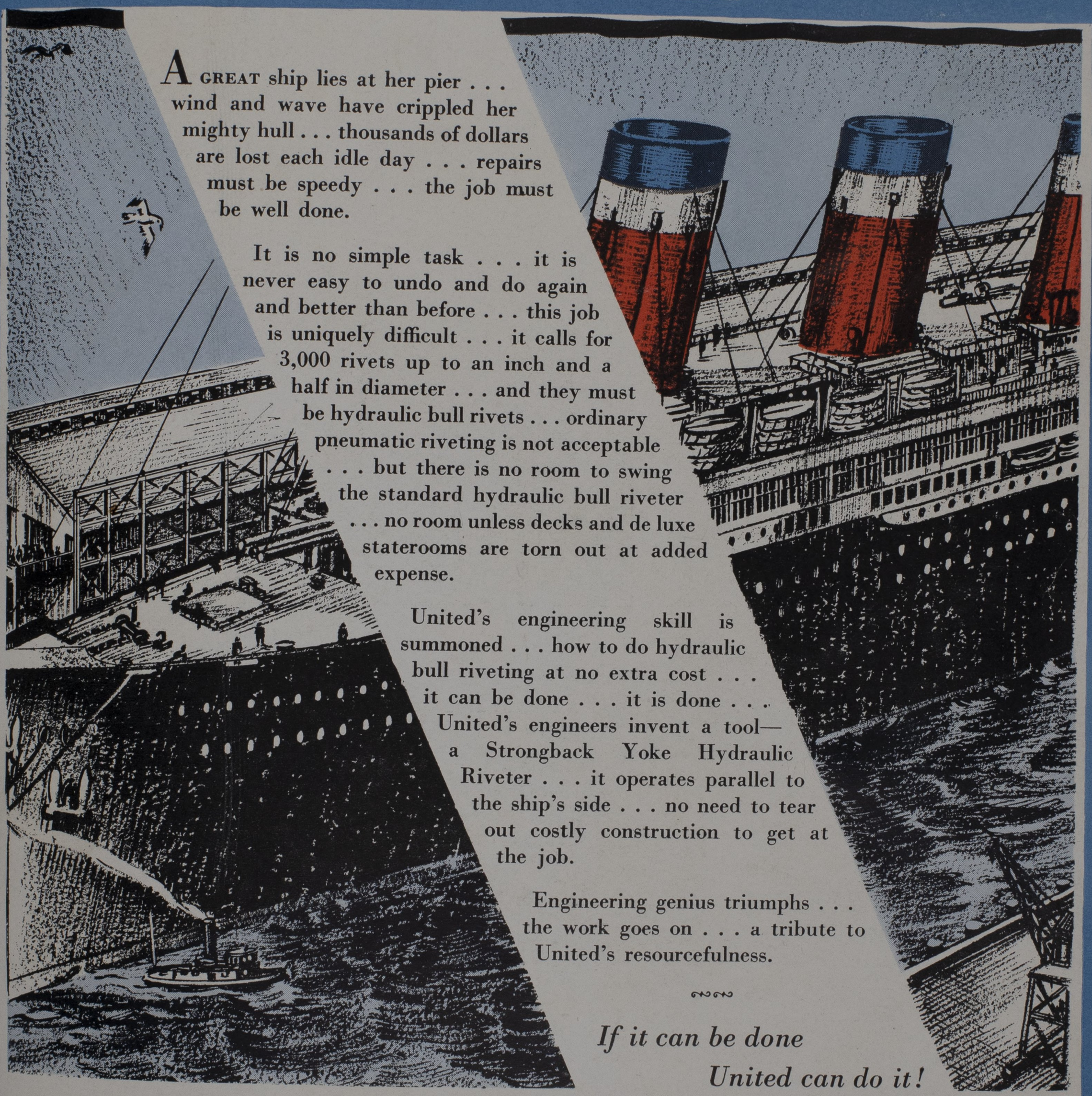
The solution tank on the top of the machine has a capacity of four gallons. Where a cleaning or preserving agent is used in solution, this feed control is an important feature.

Marine Review

Reg. U.S. Pat. Off.

The National Publication Covering the Business of Transportation by Water

MAY, 1930



A GREAT ship lies at her pier . . . wind and wave have crippled her mighty hull . . . thousands of dollars are lost each idle day . . . repairs must be speedy . . . the job must be well done.

It is no simple task . . . it is never easy to undo and do again and better than before . . . this job is uniquely difficult . . . it calls for 3,000 rivets up to an inch and a half in diameter . . . and they must be hydraulic bull rivets . . . ordinary pneumatic riveting is not acceptable . . . but there is no room to swing the standard hydraulic bull riveter . . . no room unless decks and de luxe staterooms are torn out at added expense.

United's engineering skill is summoned . . . how to do hydraulic bull riveting at no extra cost . . . it can be done . . . it is done . . . United's engineers invent a tool—a Strongback Yoke Hydraulic Riveter . . . it operates parallel to the ship's side . . . no need to tear out costly construction to get at the job.

Engineering genius triumphs . . . the work goes on . . . a tribute to United's resourcefulness.

If it can be done
United can do it!

UNITED DRY DOCKS, INC.

11 BROADWAY DIGBY 0500 NEW YORK

...WHERE IS MAINTENANCE IN PIPING?...

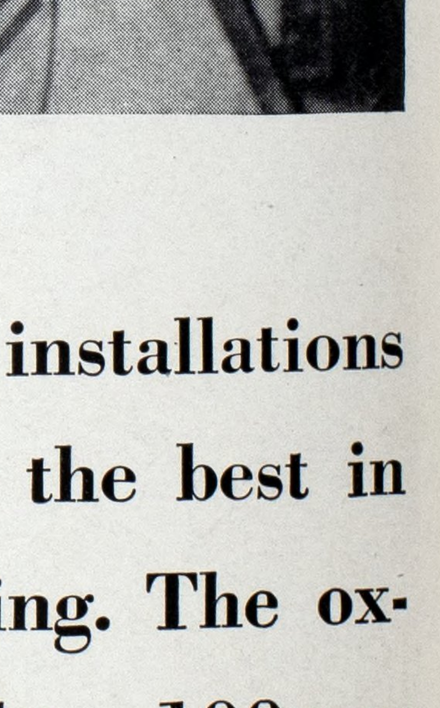
All maintenance and upkeep work in piping installations is at the joints. Progressive engineers, demanding the best in present day pipe fabrication, have adopted oxwelding. The oxwelded joint is strong, leakproof and permanently tight—100 per cent efficient . . . It eliminates joint maintenance.

THE LINDE AIR PRODUCTS COMPANY, THE PREST-O-LITE COMPANY, INC.,
OXWELD ACETYLENE COMPANY, UNION CARBIDE SALES COMPANY,

Units of UNION CARBIDE AND CARBON CORPORATION

General Offices . . 30 E. 42nd St., N. Y. UCC **Sales Offices . . . in the Principal Cities**

65 Linde plants . . . 48 Prest-O-Lite plants . . . 174 Oxygen Warehouse stocks . . . 156 Acetylene Warehouse stocks . . . 42 Apparatus Warehouse stocks . . . 245 Union Carbide Warehouse stocks



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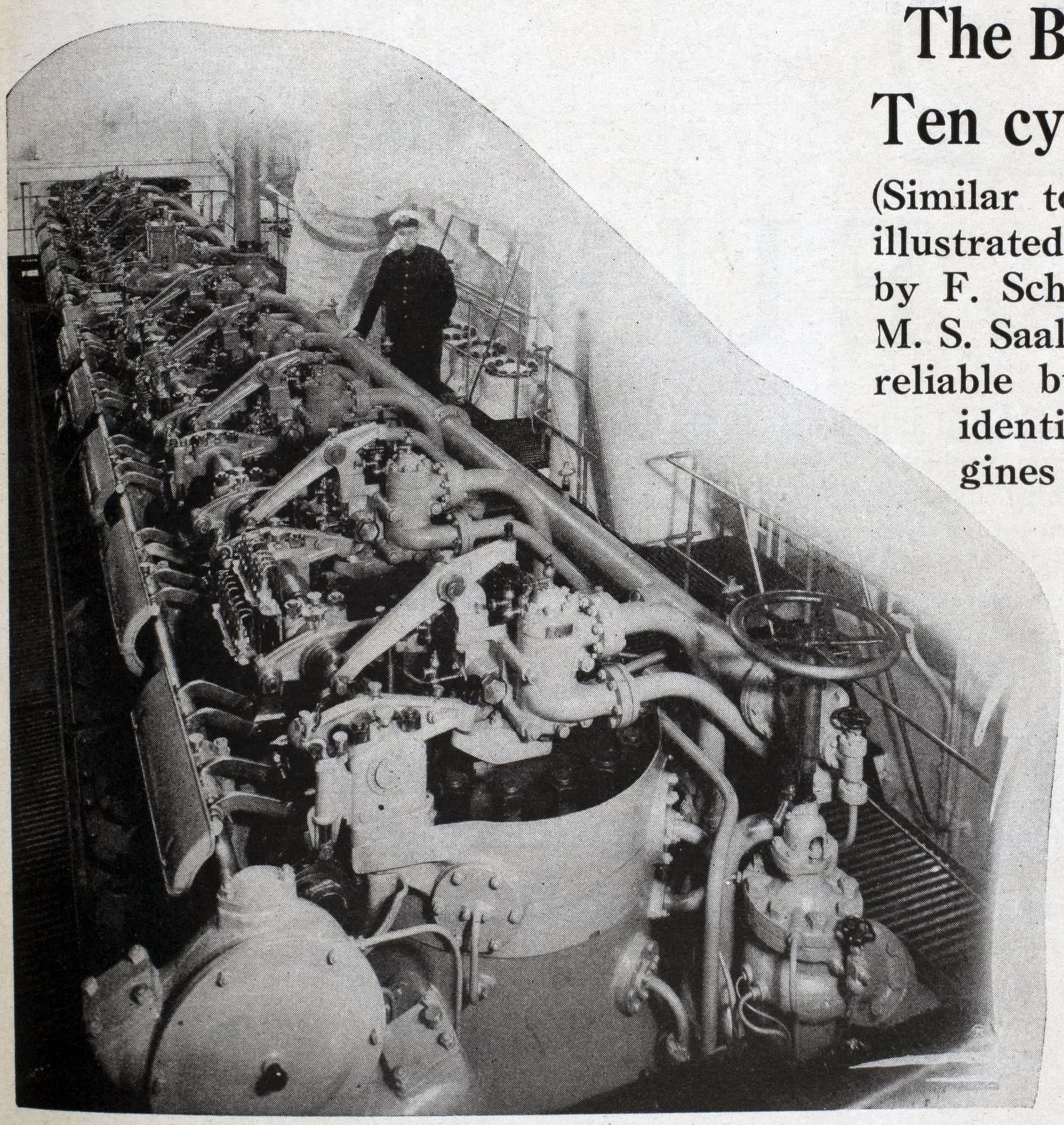
EXPORT TRADE DEMANDS LOWEST COST TRANSPORTATION TO WORLD MARKETS

Demands Replacement of about 600 obsolete war built steam cargo carriers with a fleet of

MODERN—ECONOMICAL DIESEL SHIPS

BUSCH-SULZER



7200 S. H. P.

The Busch-Sulzer Ten cylinder Diesel

(Similar to the Sulzer type illustrated, which was built by F. Schichau, Elbing for M. S. Saale) is established as reliable by performance of identical 6 cylinder engines in M. S. CITY OF ELWOOD and M. S. WARD

13—10 cylinder Sulzer-Type Marine Diesels built or building

Busch-Sulzer Bros.-Diesel Engine Co.

St. Louis, Mo.

Gargoyle D. T. E. Oils Lubricate 53% of the world's ships of over 20,000 tons

S. S. Europa, fleet new flagship of the North German Lloyd Line.

and now *The* EUROPA

When the *S. S. Europa* clipped 18 minutes off the *Bremen's* record on her maiden voyage and won the coveted blue ribbon of the Atlantic, her powerful steam turbines were correctly lubricated with Gargoyle Marine Oils.

The *Bremen*, too, depended upon these high quality lubricants to keep her power-producing machinery operating at top-notch efficiency when she broke all speed records for a trans-atlantic crossing last year.

But it did not remain for these new speed queens to prove to marine engineers the many advantages resulting from regular use of Gargoyle lubricants. Hundreds of engine experts throughout the shipping world have for many years relied on Gargoyle Marine Oils for:

the best insurance against untimely breakdowns and costly repairs;
reduced friction and power savings;
lower fuel and oil consumption;
longer engine life.

You will find a ready supply of Gargoyle Marine Oils in more than 300 of the world's leading ports. Vacuum Oil Company representatives at all these stations are thoroughly equipped to offer expert aid in meeting your own particular lubricating problems.

NOTE: We will be glad to send you, without obligation, either of our authoritative treatises on Marine Lubrication: "Steamships with Reciprocating Engines," "Marine Lubrication—Motorships." Address your request to Vacuum Oil Company, Marine Sales Department D-5, 61 Broadway, New York City.

GARGOYLE

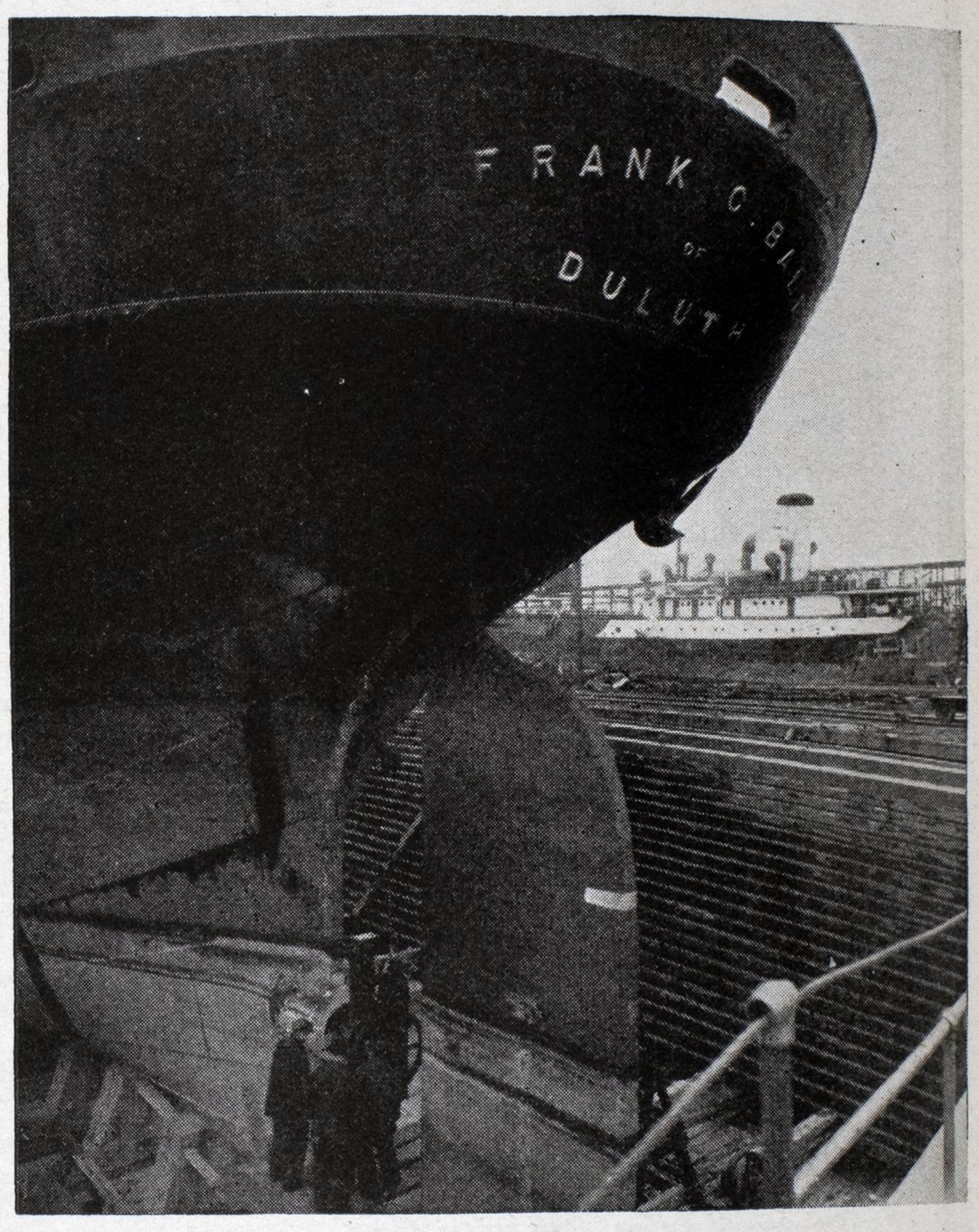
Marine Oils

A grade for every type of service

Vacuum Oil Company *Specialists in the manufacture of high-grade lubricants for every class of machinery Obtainable everywhere in the world* **New York, U. S. A.**

Every "AMERICAN SHIP" repair job sustains our reputation for utterly dependable work . . . .

Down in the dry dock these American Ship men are boring out the stern bearing of this big freighter. Such jobs as this built and continue to build American's reputation for complete dependability.



WE gained our reputation for completely dependable work more than thirty years ago when we first began to build and repair ships for operators and owners on the Great Lakes; back in the days before turbine-powered vessels and motor ships.

We have kept it ever since, because we have constantly kept our resources—equipment and manpower—advancing with the times. At each of our five strategically located shipyards we have concentrated complete modern ship building and repair facilities which enable us to care for any size repair job adequately and swiftly.

But back of these extensive facilities are our men, skilled and seasoned: Men, whom long experience has given a keen insight into ship operators' problems, to plan each job; men, who love and understand ships, to execute it—with the result that whenever you send a ship to "American" for repairs, you get a good, dependable job, worth every cent it costs and more.

Our old customers have enjoyed this satisfying service for years. They continue to stay with us, and now send us *all* their repair work. Other ship operators and owners are deciding with each new season that good, dependable work is cheapest in the long run. So, more and more, operators and owners are turning to American Ship for all their repair jobs—big and little.

The AMERICAN SHIP BUILDING CO.

CLEVELAND	LORAIN	BUFFALO	SOUTH CHICAGO	SUPERIOR
American Ship Building Co.	*American Ship Building Co.*	*Buffalo Dry Dock Company*	*Chicago Ship Building Co.*	*Superior Shipbuilding Co.*

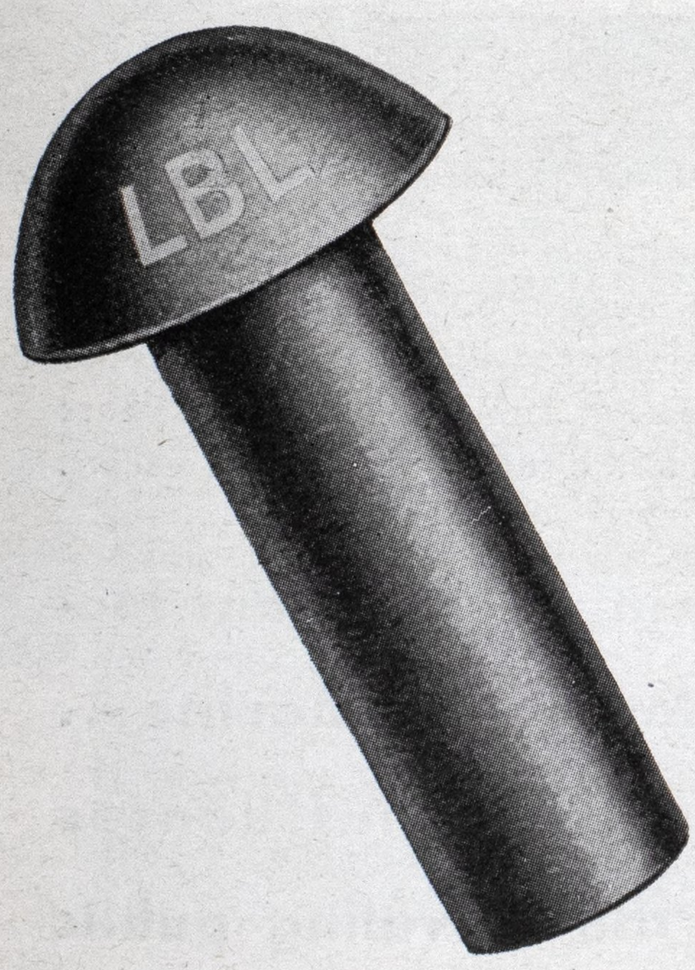
Specify

"LEBANON" RIVETS

for your

Re-riveting Jobs

—They "Stay put"



"LEBANON" Genuine Puddled Wrought Iron Rivets have the highest corrosion-resistance and can be depended upon to effect real savings in under-water riveting costs.

"LEBANON" Rivets meet LLOYDS and AMERICAN BUREAU classifications, *and are not expensive.*

Our Mills at Lebanon and Scranton are advantageously located to make quick shipments and can meet your fullest requirements.

We solicit your request for samples and full data.

Wrought Iron Company of America

Largest Producers of Wrought Iron Bars in the United States

General Offices: Lebanon, Pa. Works: Lebanon and Scranton, Pa., and Rome, N. Y.

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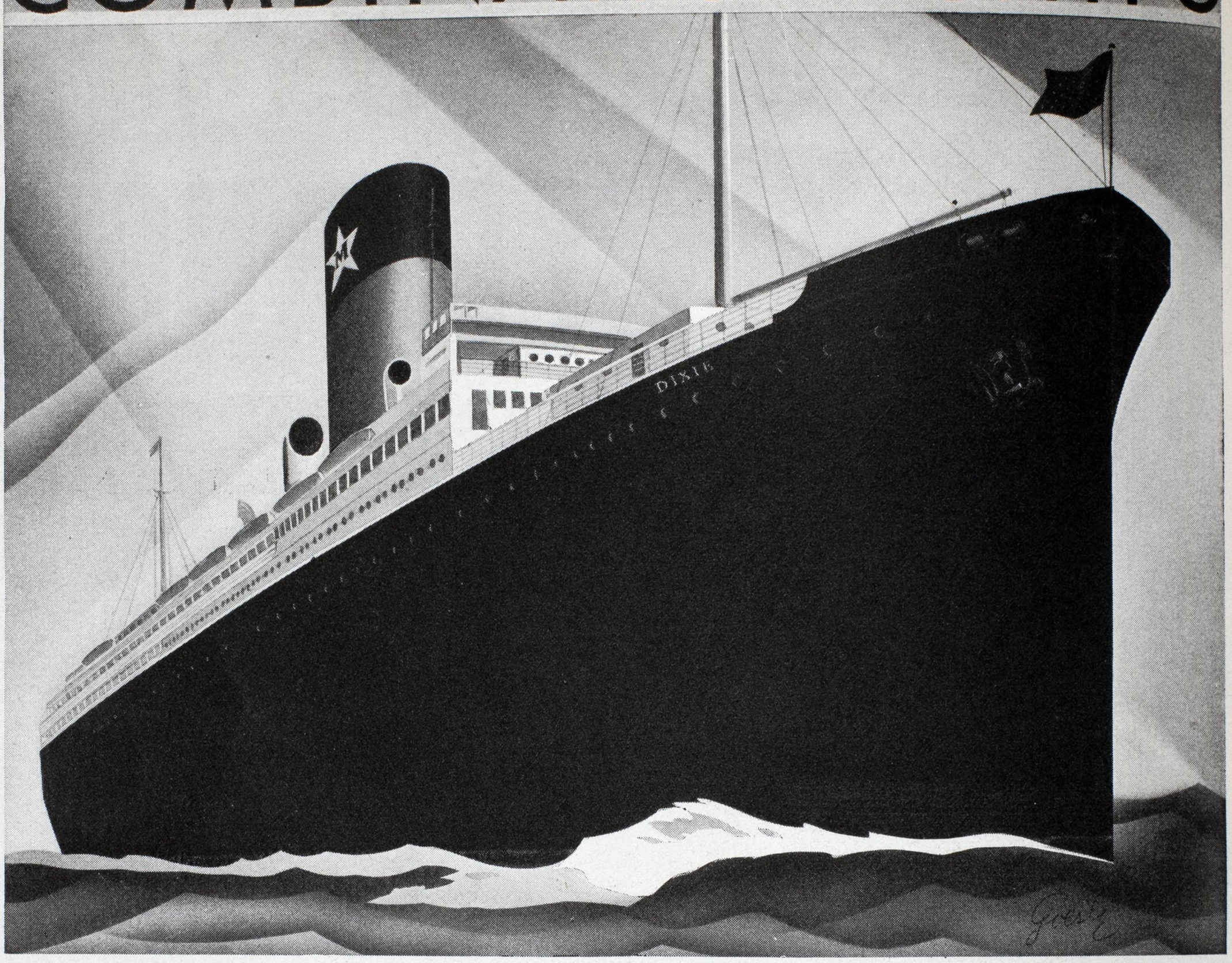
FEDERAL BUILDS GOOD SHIPS

COMBINATION SHIPS



S. S. "Dixie," built for the Southern Pacific Steamship Lines, was the first American merchant ship equipped with high efficiency geared turbines and water tube boilers, operating at 350 lbs. pressure and total temperature of 630° F. Accomodations for 333 passengers are provided, also modern cargo handling equipment. The ship, after two years operation, meets all the expectations of the owners.

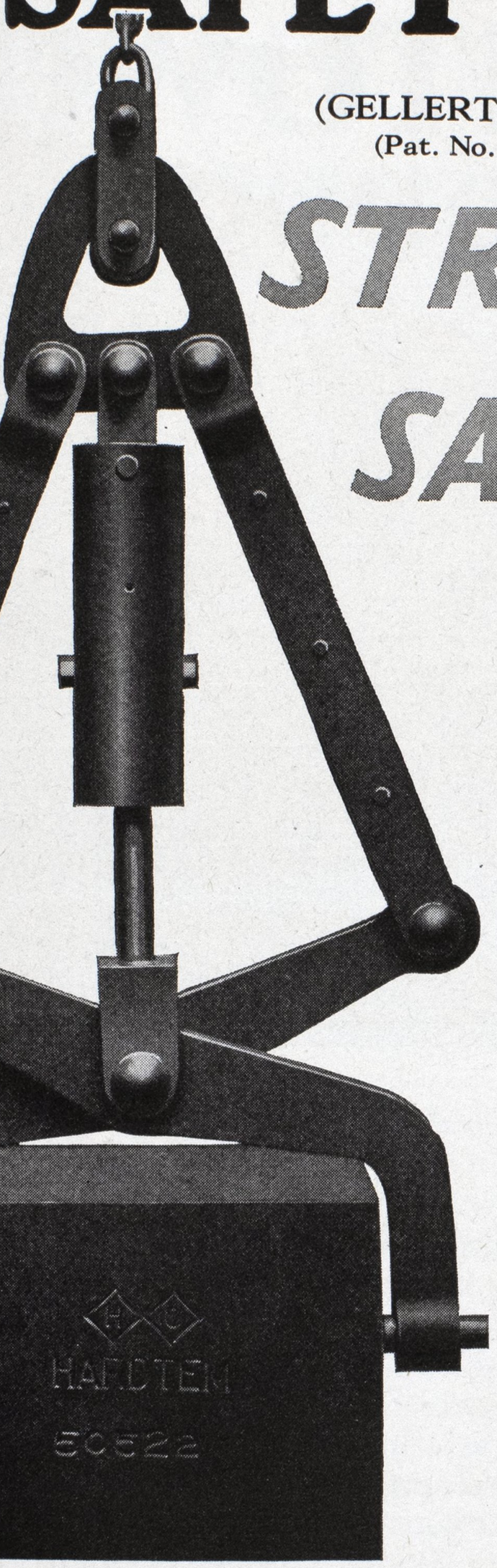
More and more is this class of ships becoming a dominant factor in the upbuilding of the American Merchant Marine... The character of the cabinet and joiner work influences vitally the popularity of such ships with the traveling public ...To assure complete success of this important feature, Federal became affiliated several years ago with the well established joiner organization which had performed such outstanding work on the steamship "Malolo" and has since been selected for the joiner work on the new 26,000 ton Matson liners.

FEDERAL SHIPBUILDING AND DRY DOCK COMPANY
GENERAL OFFICES AND WORKS: LINCOLN HIGHWAY, KEARNY, NEW JERSEY
SUBSIDIARY OF UNITED STATES STEEL CORPORATION

AUTOMATIC SAFETY TONGS

(GELLERT PATENTS)
(Pat. No. 1,506,827)

STRONG SAFE



A PURELY mechanical automatic latch . . . fully self-contained . . . only two moving parts . . . no springs or counterweights, pull or release ropes . . . always positive action—practically no wear, lubrication or adjustment necessary.

Operated by cranemen only, requiring no ground men. Load cannot be released until placed at rest and tongs dropped. Tongs cannot be released when carrying loads.

Design of grips varies according to the load to be carried. Special types designed for handling special products. Write for details and prices.

ENTIRELY AUTOMATIC

HEPPENSTALL COMPANY

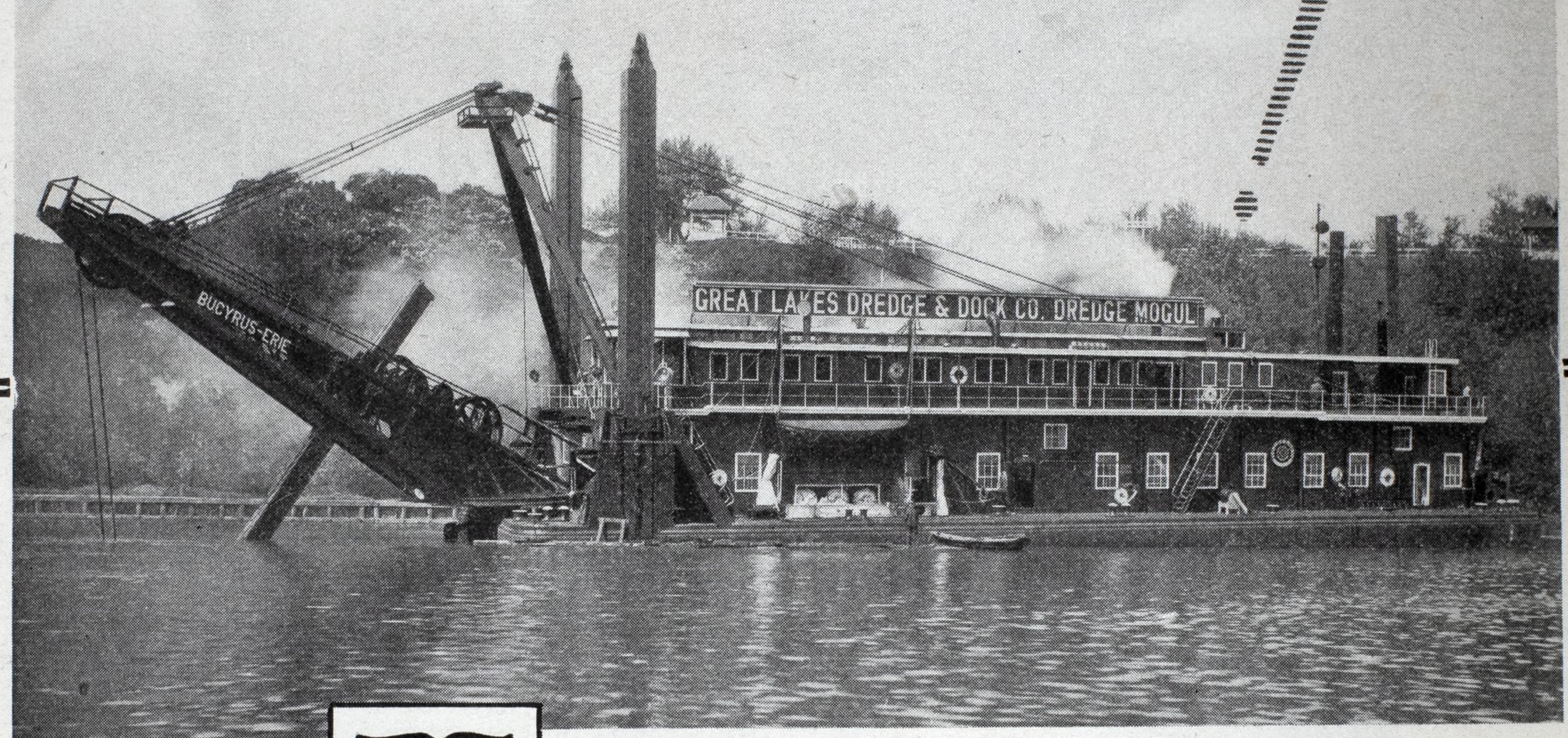
BRIDGEPORT PITTSBURGH DETROIT

Branch Offices:

Boston, Bridgeport, New York, Philadelphia, Buffalo, Fenwick Freres, Denver, Cleveland, Detroit, Indianapolis, Syracuse, Paris, St. Louis, Milwaukee, Fort Worth, Los Angeles, Chicago, France

HEPPENSTALL

Another MANITOWOC PRODUCT



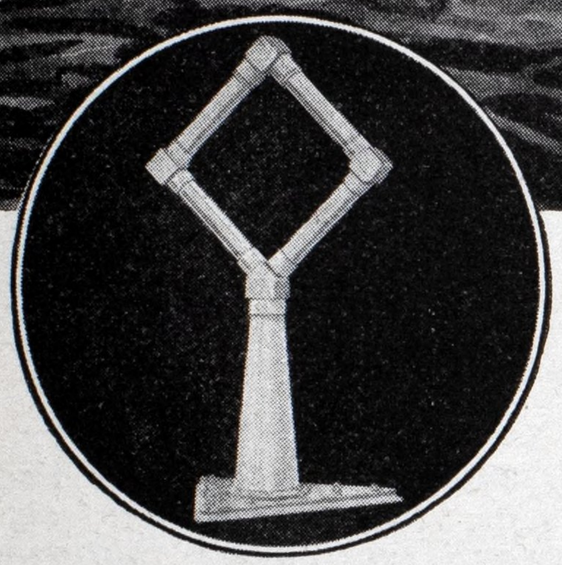
THE 8 cu. yd. Diesel Electric Dipper Dredge MOGUL was built for Great Lakes Dredge & Dock Co., Chicago. It is equipped with a 12 cu. yd. dipper for ordinary work but will heap up to a load of 16 yards in lighter materials. An 8 cu. yd. dipper is used for dredging rock. Maximum digging depth is 42 ft. of water. The MOGUL is 156′0″ x 42′6″ x 12′8″—1200 H.P., equipped with Bucyrus-Erie dredging machinery and Busch Sulzer Diesel engine. It has living quarters for a crew of twenty-three men.

It will pay you to consult Manitowoc when in the market for dredges, steel passenger and freight vessels, carferries, tankers, fire boats, sand suckers, tugs, scows, lighters, marine engines, marine boilers, ship auxiliary equipment, etc.

MANITOWOC SHIPBUILDING CORPORATION

Manitowoc, Wisconsin

A CRASH IN THE FOG!



Unprotected—NO RCA DIRECTION FINDER

Through dense fogs and heavy storms more and more ships are being protected and guided by the RCA Radio Direction Finder. Entire fleets are now equipped with this device...Hundreds of ships are operated with a far greater degree of safety and efficiency because of this amazing instrument of modern navigation.

The RCA Radio Direction Finder is one of the greatest inventions ever perfected for combating fog, rain, snow or sleet. Ship owners and navigators all declare that every storm condition can be materially overcome through the use of this new device. It is today's greatest single contribution for increased safety at sea.

Unsurpassed in efficiency, the Radiomarine Corporation enjoys the benefits of vast research, engineering and production facilities. It also maintains the world's greatest system for shore to ship communication, enabling owners and agents to keep in constant touch with their vessels.

Complete RCA Service includes

1. *Equipment*—Transmitting and receiving equipment of the vacuum tube type; radio direction finder.
2. *Service on equipment*—Regular inspections at any of seventeen ports; maintaining at principal ports stocks of spare parts for repairs and renewals.
3. *Operators*—Detailing of experienced operator personnel to the ships.
4. *Coastal stations*—Maintenance of fifteen coastal stations on the Atlantic, Pacific, Gulf and Lakes, for prompt, efficient handling of radio traffic.
5. *Accounting*—Checking and settling of accounts.
6. *Licenses*—Procuring of government licenses.

Radiomarine coastal stations are located at the following points:

Chatham, Mass.	Baltimore, Md. (city station)	Cleveland, Ohio
New London, Conn.	Palm Beach, Fla.	Chicago, Ill.
East Moriches, L. I.	Galveston, Tex.	Duluth, Minn.
New York, N. Y.	Port Arthur, Tex.	Los Angeles, Cal.
Tuckerton, N. J.	Buffalo, N. Y.	San Francisco, Cal.

Radiomarine storerooms and service stations in charge of radio men of long experience are located at the following ports:

Boston	Norfolk	Port Arthur	Duluth
New York	Savannah	Buffalo	Los Angeles
Philadelphia	New Orleans	Cleveland	San Francisco
Baltimore	Galveston	Chicago	Seattle
		Honolulu	

RADIOMARINE CORPORATION OF AMERICA

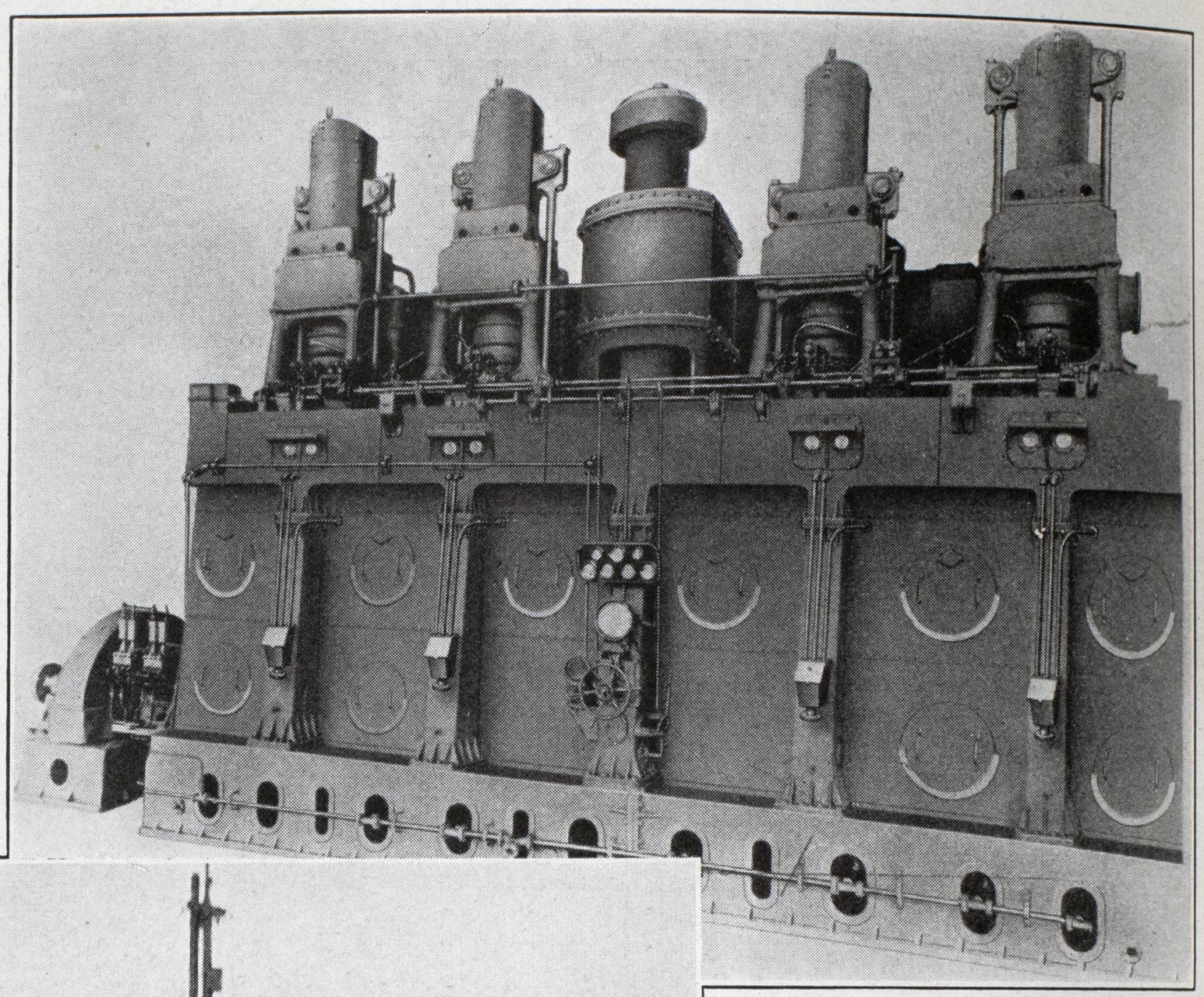
(A Subsidiary of Radio Corporation of America)

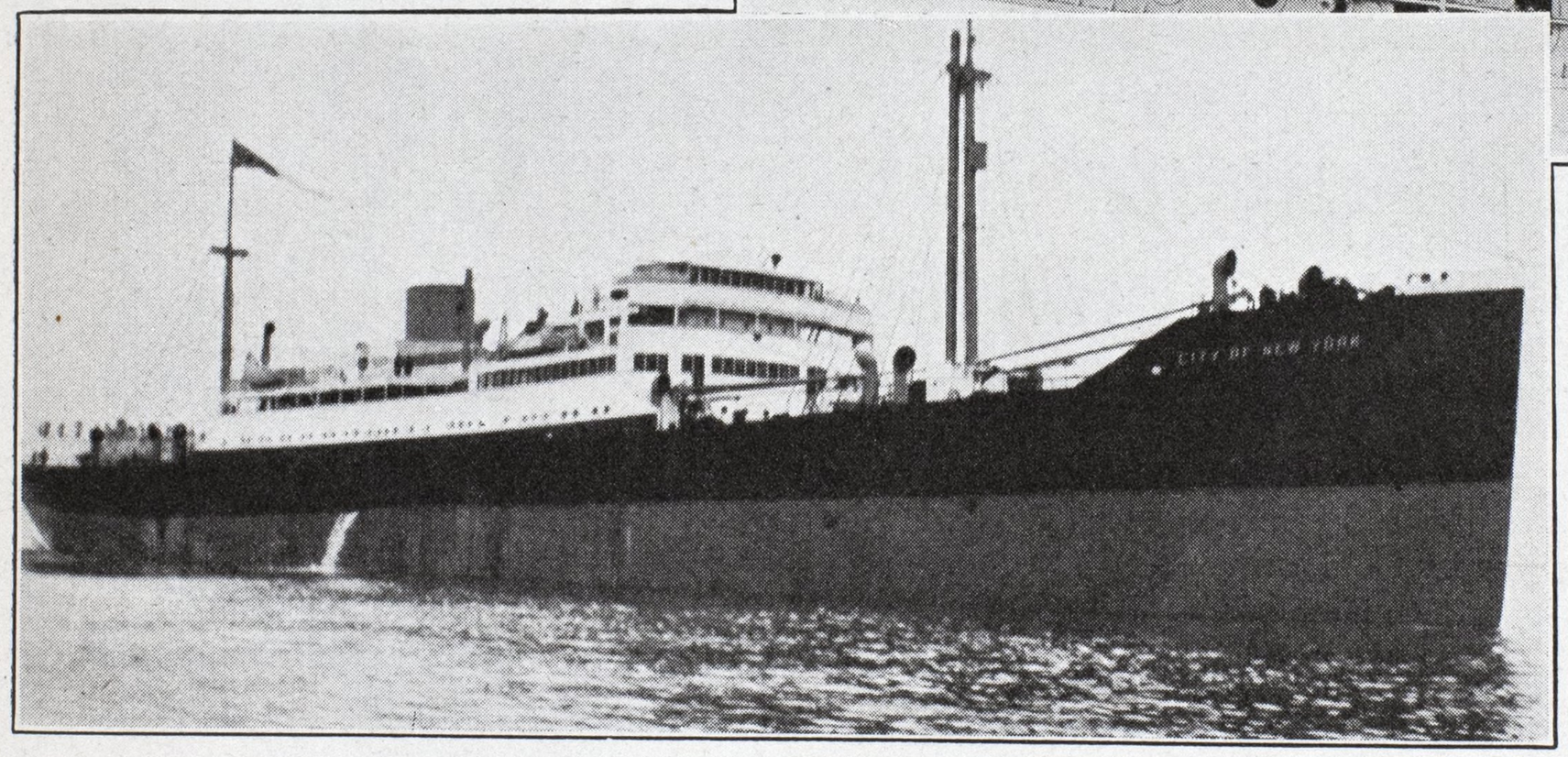
66 BROAD STREET

NEW YORK

Power with Efficiency

SUN-DOXFORD Opposed-Piston DIESEL ENGINES





The Ms. City of New York, first big combination freight and passenger motorship built in America, is owned by the American South African Line. Her length is 470 ft. 8 in., deadweight capacity 9350 tons, first class passenger accommodation 60, power 5400 s.h.p. and speed 14 knots

Builders of

Passenger and Cargo Vessels—Oil Tankers

Unlimited facilities for

MARINE REPAIRS

Two floating Dry Docks
11,000 Tons Lifting Capacity Each

DRYDOCKING AND REPAIRS

BUILDERS OF ALL TYPES OF VESSELS

SUN SHIPBUILDING & DRY DOCK COMPANY

Shipyard & Main Office
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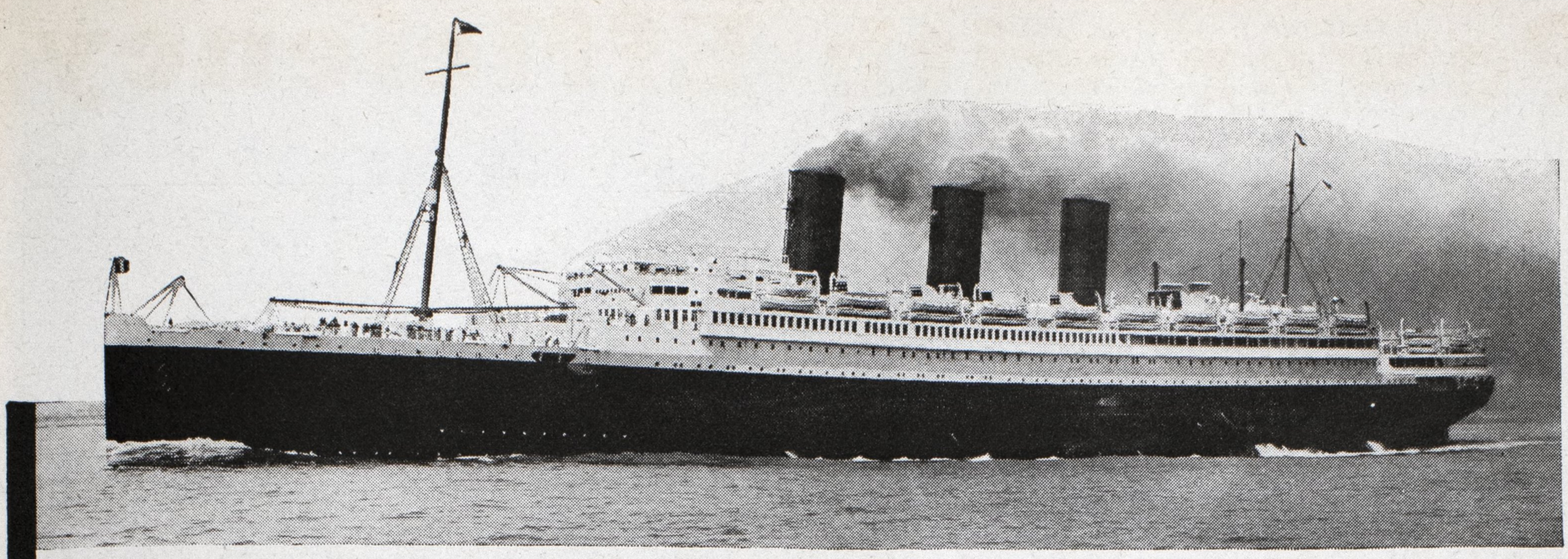
25 Broadway
NEW YORK



The *new* S.S. Paris modernizes with Simmons

NOWHERE could you find a more dramatic example of the pace of today's passenger traffic competition than in the case of the French Line S.S. Paris.

When, in 1921, she first entered service, her use of the art moderne style of decoration caused a sensation. Nothing like her had ever been seen on the seven seas.

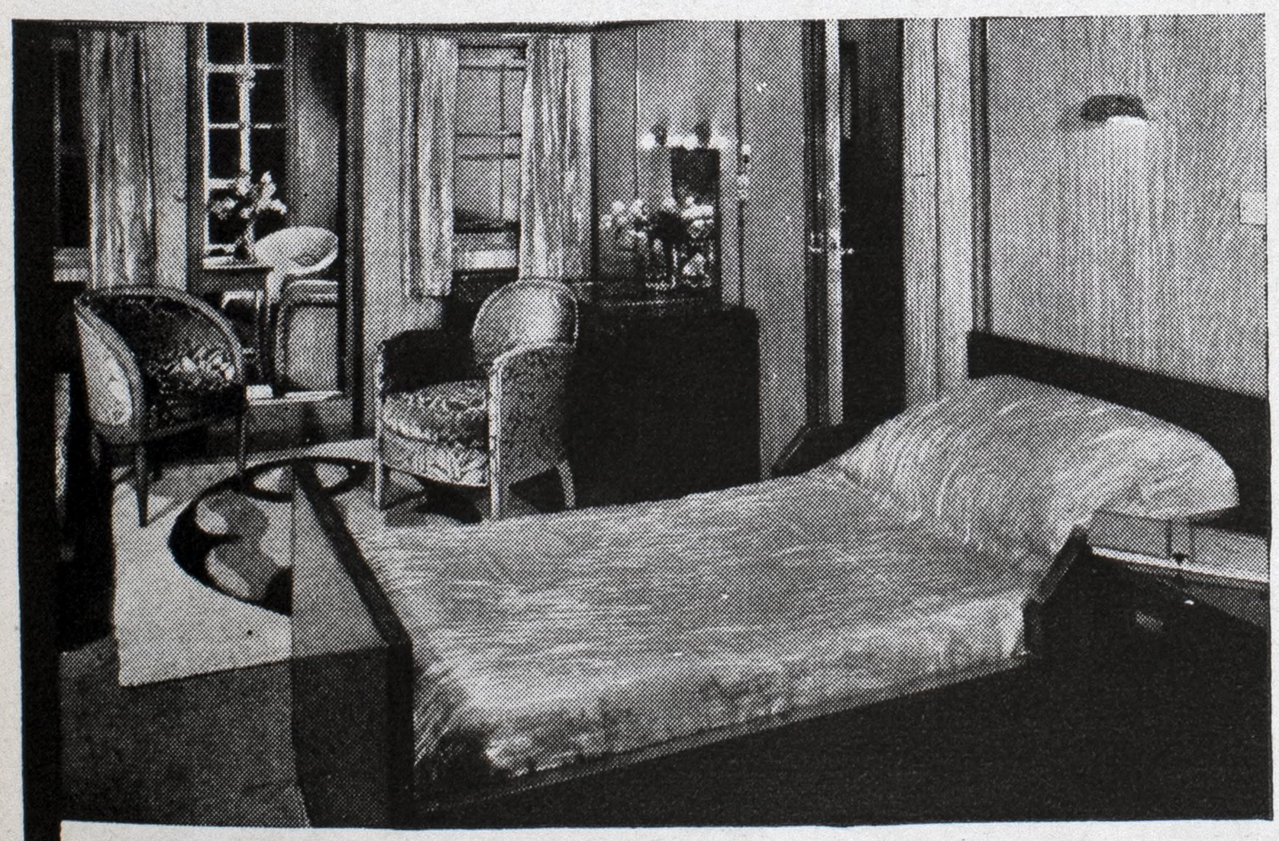
Yet, since that day, ships have slid down the ways to surpass her in the race for public favor, notable among them her big sister, the Ile de France. But today, remodeled in every way, redecorated and refurnished, she is virtually a new ship—the last word in the handling of every *modern* detail.

The exquisite charm of her public saloons has been carried into every stateroom, and to it has been added that last touch of comfort so essential to winning public favor.

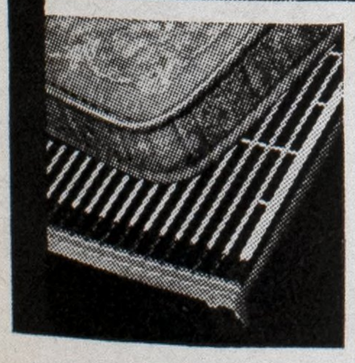
No hotel—no private home offers greater sleeping luxury than this splendid modern liner—because she's Simmons equipped.

Internationally known and recognized by the public as the finest sleep equipment made, Beautyrest Mattresses and Slumber King Springs were chosen when the S.S. Paris was modernized according to today's highest standards.

We will help you prepare estimates, if you wish. Write to The Simmons Company, Contract Division, 666 Lake Shore Drive, Chicago, Illinois.



A typical "modern" room aboard the S. S. Paris—modern in every detail, including Simmons Spring and Mattress.



The Beautyrest Mattress and Slumber King Spring

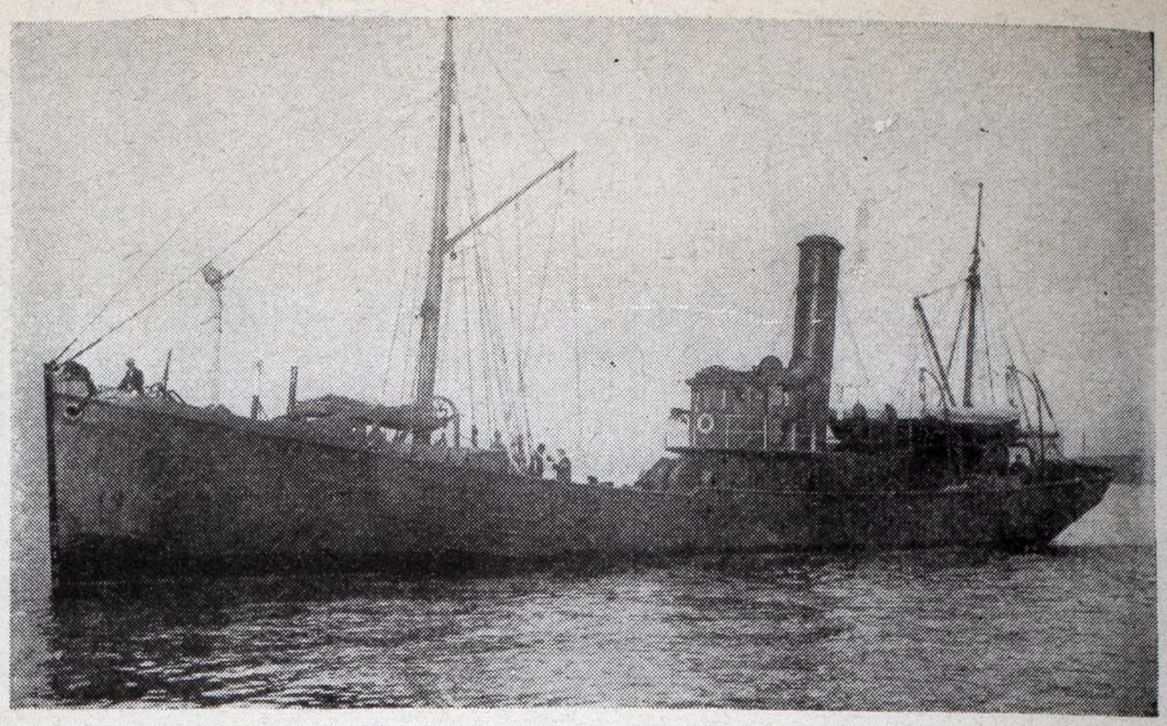
■

SIMMONS

BEDS · SPRINGS · MATTRESSES

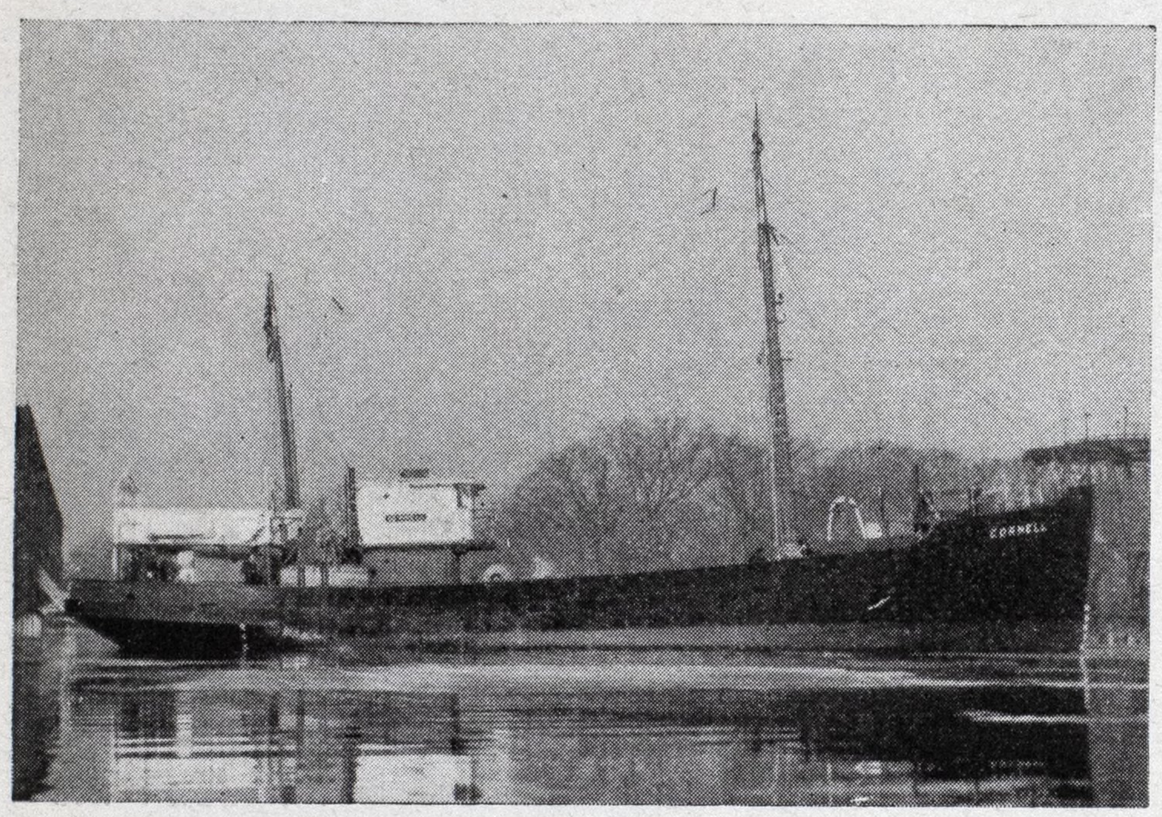
METAL FURNITURE

AND BERKEY & GAY FURNITURE

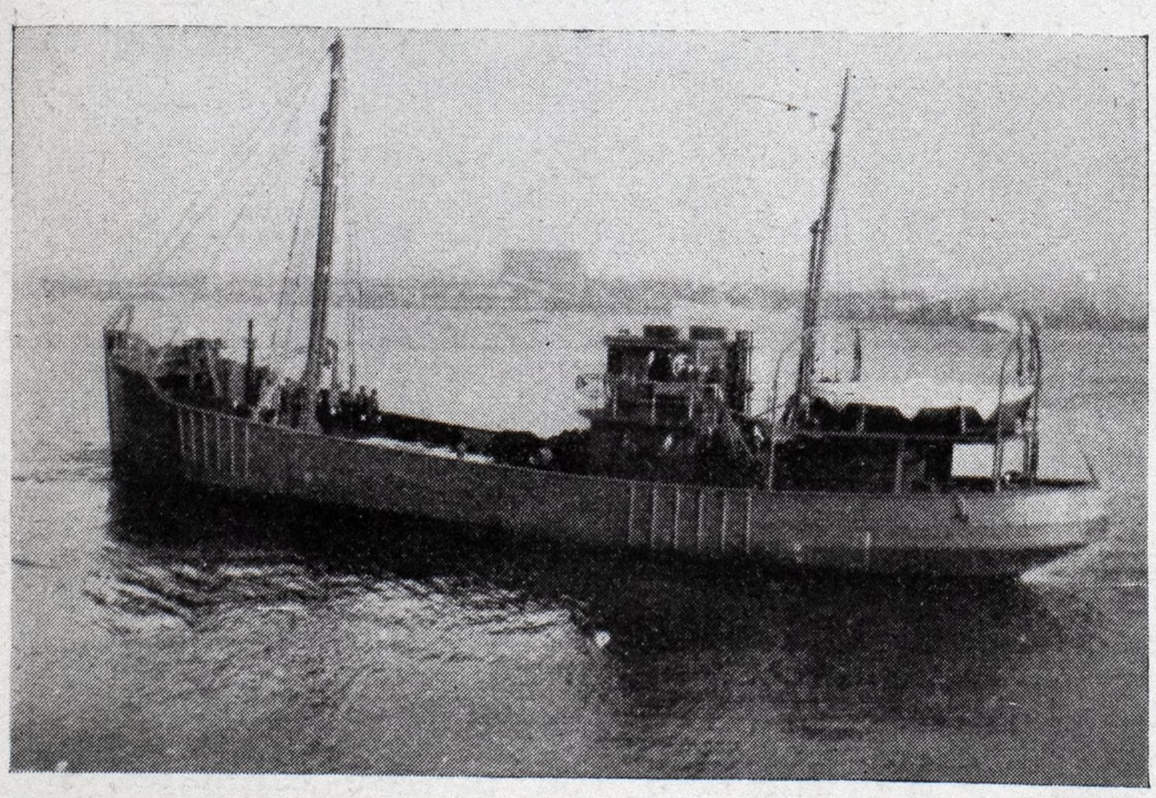


PATRICK J. O'HARA, Diesel Trawler, owned by O'Hara Bros., Boston. This vessel originally named the SPRAY was built in 1905 for the Bay State Fishing Company. It is still in service.

For the HARDEST SERVICE on the Seven Seas



CORNELL, Diesel Trawler, one of three Trawlers recently built for General Sea Foods Corporation



QUINCY, one of four Diesel Trawlers built for R. O'Brien Company of Boston, Mass.

Trawlers built by Bethlehem are noted for their sturdy construction, their ample power, and excellent arrangement of handling facilities. For 25 years Bethlehem has been building trawlers to meet the requirements of leading operators. These vessels are meeting every demand, in the hardest service on the seven seas—trawling on the Grand Banks.

TRAWLERS

recently completed by Bethlehem

R. O'Brien & Co., Boston, Mass.	*Bay State Fishing Company*
QUINCY	BREAKER
DORCHESTER	SWELL
WINTHROP	BILLOW
WILLIAM J. O'BRIEN	CREST
	SURF
	WAVE

General Sea Foods Corporation	*Mass. Trawling Co.*
CORNELL	SHAWMUT
DARTMOUTH	TRIMOUNT
AMHERST	

BETHLEHEM SHIPBUILDING CORPORATION, LTD.—BETHLEHEM, PA.

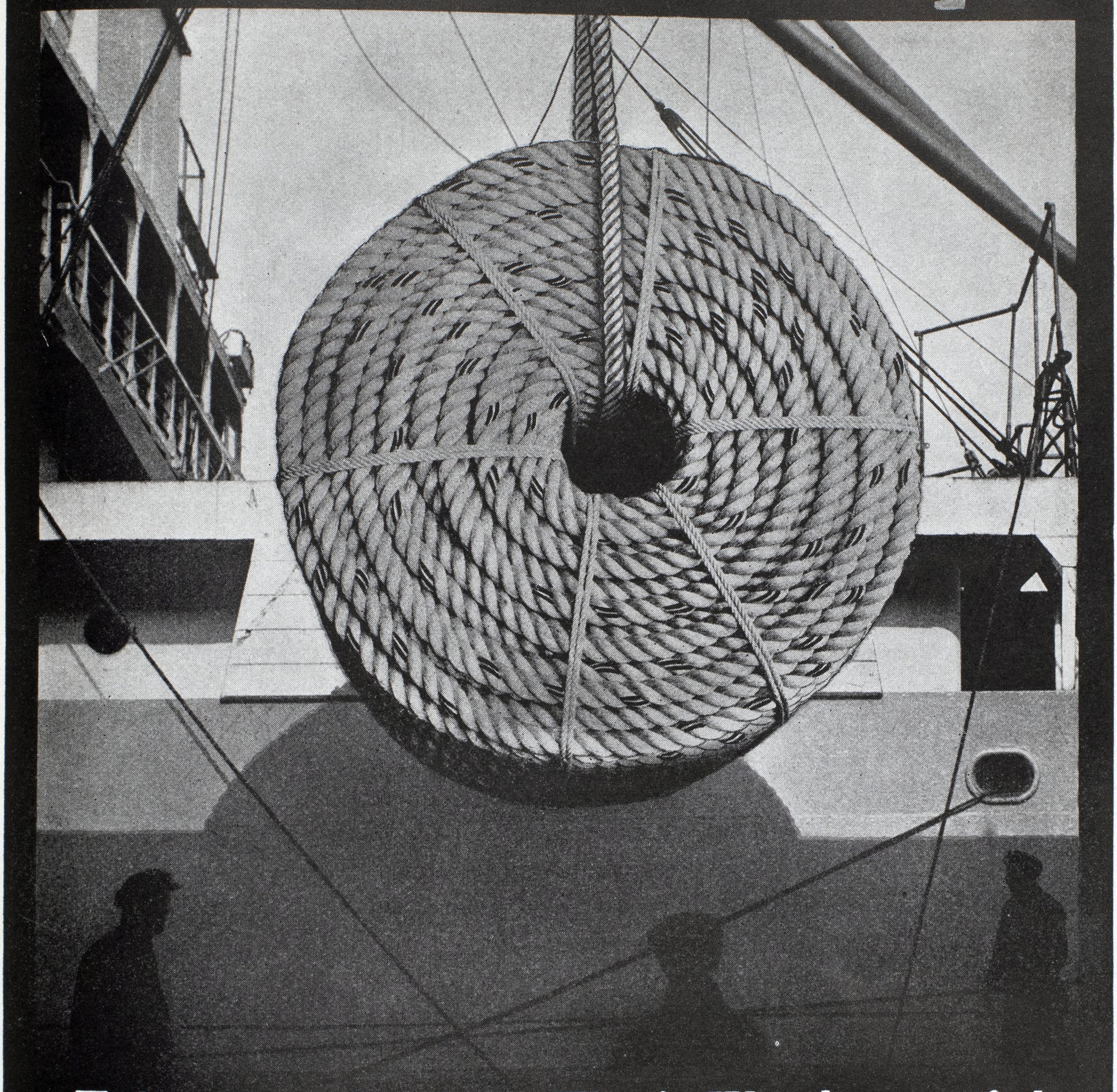
General Sales Offices:

Atlantic Coast: New York: 25 Broadway **Pacific Coast: San Francisco: 20th and Illinois Sts.**

District Offices: Boston, Baltimore and San Pedro

BETHLEHEM
STEAM AND *DIESEL TRAWLERS*

Columbian Rope



Take Aboard a Rope That's Weatherproofed

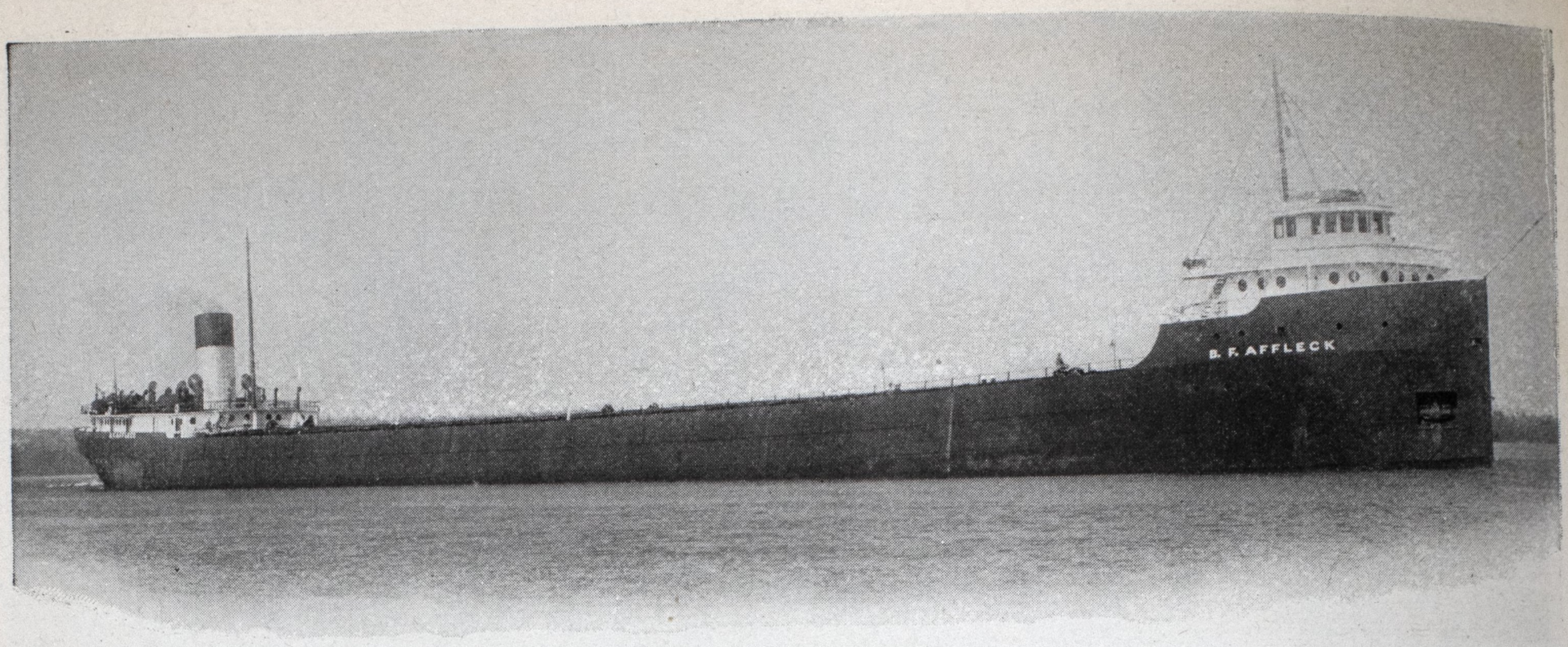
You can tell by the red, white and blue surface markers that the rope is Columbian *Tape-Marked* Pure Manila.

Columbian is built to withstand all variations of climate. By reason of the Columbian method of waterproofing, all *Tape-Marked* Rope is flexible, wet or dry. This important feature goes hand in hand with Columbian's great strength and durability, making it the ideal rope to take aboard.

COLUMBIAN ROPE COMPANY

Auburn, N. Y. *"The Cordage City"*

Branches:- New York Chicago Boston New Orleans Philadelphia



B. F. AFFLECK

Finest Type of Great Lakes Cargo Carrier

S.S. B. F. Affleck owned and operated by the Pittsburgh Steamship Company, is a single deck bulk cargo vessel of the standard type built for the iron ore, coal and stone trade of the Great Lakes. Her molded dimensions are: Length overall, 604 feet, length between perpendiculars, 580 feet; width 60 feet and depth 32 feet. Capacity 12,000 tons.

A diversified experience, covering the construction of all types of ships, fully qualifies us to meet *your* requirements thoroughly and with despatch.

Some Other Ships We Have Built

Auto Ferry, LA SALLE
Auto Ferry, ESSEX
Car Ferry, WABASH
Car Ferry, CHIEF WAWATAM
Car Ferry, ST. MARIE
Car Ferry, ANN ARBOR No. 5
Twin Screw Excursion Steamer, THOUSAND ISLANDER
Self Unloading, JOHN W. BOARDMAN

Toledo
Shipbuilding Company, Inc.
Toledo, Ohio

Sail . . . Ship

under the Stars and Stripes

Not solely on patriotic grounds but primarily because of the pre-eminent service this line extends. A perfect passage for every purse . . . a fast express freight service in the North Atlantic. Your own ideas of fine food . . . fine comfort . . . fine accommodations in travel; your own ideas of efficiency and intelligence in the handling of freight. American standards from stem to stern!

This service is most comprehensive. You can book passage direct to Germany, to England, to Ireland or to France. You can travel swiftly or leisurely . . . in luxury or with comfortable simplicity. On the Leviathan, world's largest liner . . . or in one of five magnificent but modest-priced cabin ships, George Washington, S. S. America, S. S. Republic, President Roosevelt and President Harding. Or direct from New York to London weekly on one of the express mail and cargo vessels of the American Merchant Lines: American Banker, American Farmer, American Merchant, American Shipper and American Trader. See your nearest agent or one of our many offices for rates, accommodations and sailings.

UNITED STATES LINES

RIVER ROUGE PLANT

Foot of Great Lakes Avenue
Telephone Cedar 0011 **After 5 P. M. Call**

CHARLES E. BAISLEY, Plant Manager
564 W. Drayton Ave., Ferndale, Mich.....Royal Oak 3768

M. W. LACY, Assistant to Plant Manager
326 Chestnut St., Wyandotte, Mich.....Wyandotte 1154

FRANK M. SCOTTEN, Mechanical Engineer
1450 Elmwood Court, Dearborn, Mich.....Dearborn 447

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71 Elm St., River Rouge, Mich....Cedar 4290-J

JOHN GREIG, Docking Foreman
110 Walnut St., River Rouge, Mich.....Cedar 5558-W

FRED ERNST, Supt. Machine Shops
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ALLEN TUCKER, Watchman
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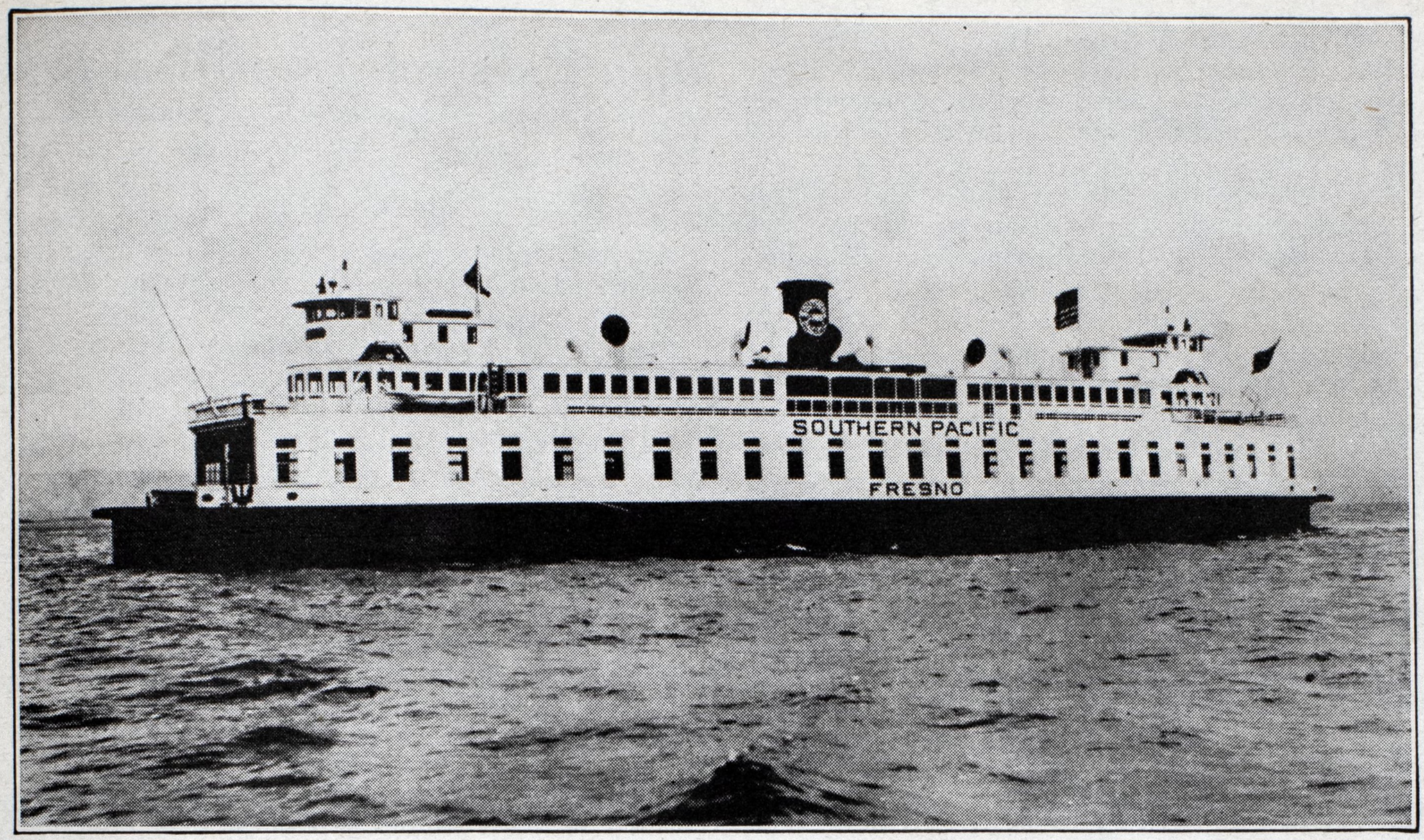
Automobile-ferry Fresno, one of fleet of six sister ships operating in San Francisco Bay. Length overall 256', beam at main deck 63' 6", depth of hull 19' 9". 2470 tons gross. Each boat powered by four 450 B.H.P. 6-cylinder, type 6 MI-22 Nelseco Diesels. Automobile capacity 90. Passenger capacity 500. Speed 13.6 knots. Sister ship of Lake Tahoe, Stockton, Mendocino, Santa Rosa, and Redwood Empire.



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One of the most striking examples in existence of the economy of Diesel-electric propulsion is given by six ferries of the Southern Pacific Golden Gate Ferries, Ltd., operating between San Francisco, Oakland and Sausalito . . . These are the largest Diesel-electric automobile ferries in the world, and have been in continuous operation since commissioned in 1927. *The total operating expenses, over that three-year period, have been approximately* 55% *of the cost of corresponding steam ferries.*

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Not only in economy, but in reliability and flexibility, Nelseco Diesels are outstanding. They have helped many marine organizations to reduce expenses and increase profits. There are Nelseco Diesels for yachts, tow-boats, passenger, freight and fishing vessels of all types. We shall be glad to send you complete information. Write for Catalog MR.

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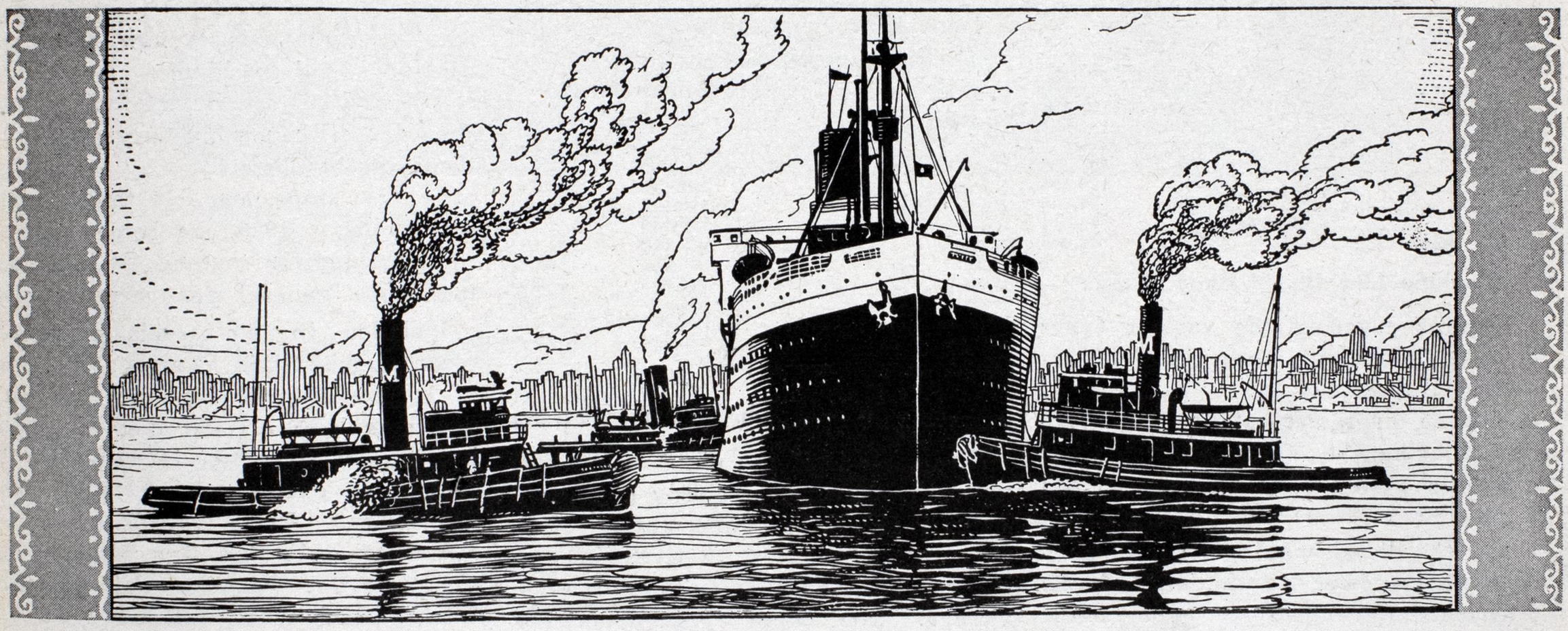

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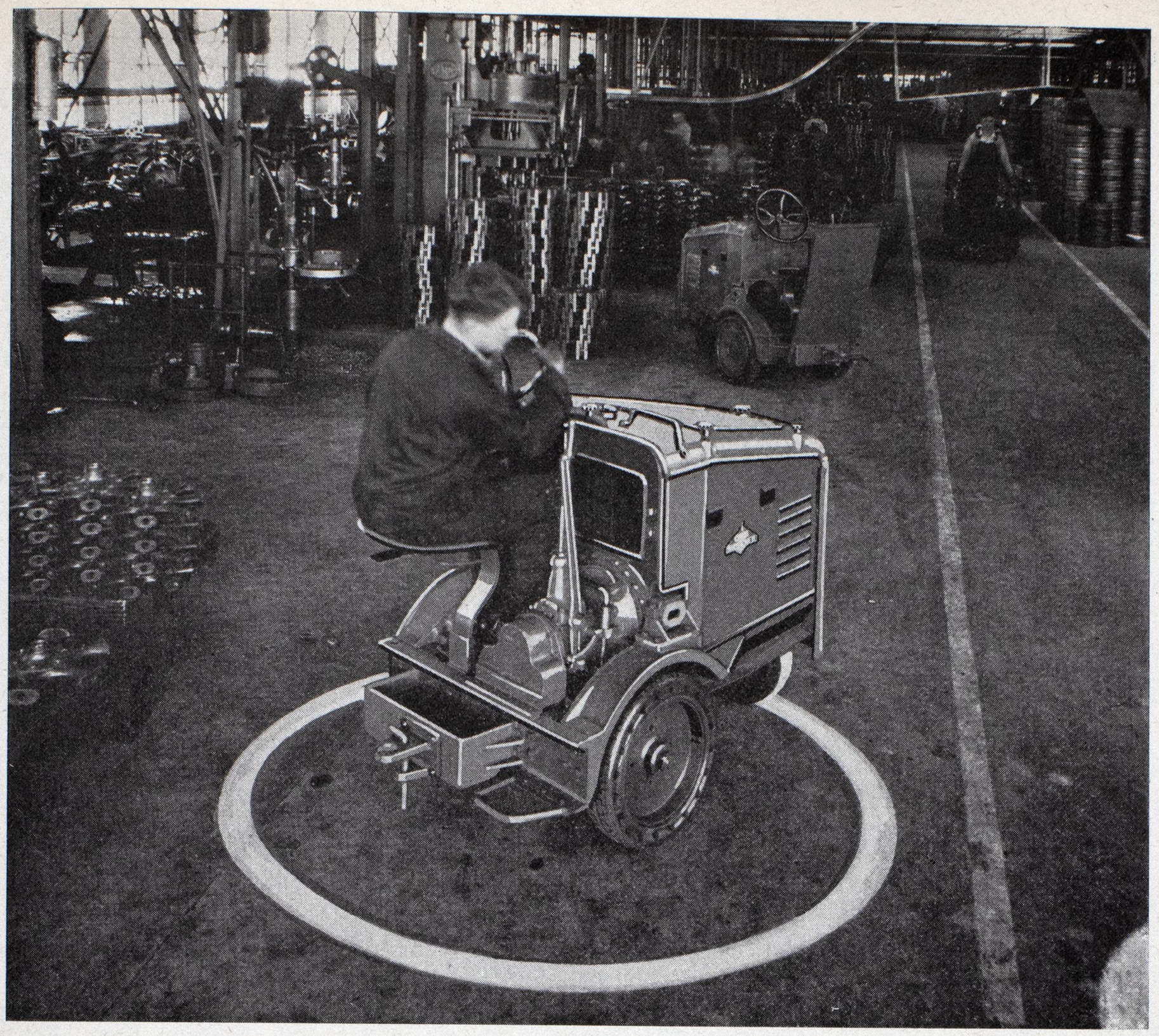

"Clarkat"—38½" wide, 78" long, 51" turning radius, 2000-lb. max. drawbar pull, ½ to 7½ mi. per hr.

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"CLARKAT" TRUCTRACTOR

Minutes saved mean dollars earned. The "Clarkat" multiplies man power—enables your huskies to do more work, more easily, in less time. The transportation world's smallest, most active tractor for pushing and pulling trailers.

Whisks a train of cargo-laden trailers along warehouse aisles, through narrow doorways, up ramps, spots them on deck, driver uncouples without dismounting, pivots on one rear wheel and speeds back to the wharf for another train while the first is being unloaded. An agile, nimble tractor that turns around easily in a boxcar—any man who drives a car will be at home with its controls.

The "Clarkat" is cutting cargo handling costs on the seven seas. Write for information, mentioning this advertisement.

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Clark vehicles are gas-powered—therefore competent for 24 hour continuous service and just as potent the last hour as the first.

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Battle Creek, Michigan

IF HIGH WAGES ARE CONTINUED

. . . freight handling costs must be reduced

IN line with increased wages paid to labor on the docks, the rising cost of marine terminal operation calls for more efficient handling — if profits are to be maintained.

Many operators are finding the solution to the problem in electric power trucks. Traveling three times as fast as a man walks, and carrying eight times the load that can be handled on a hand truck, electric trucks multiply the capacity of workmen many times. As truck operators, they can be paid more because they earn more.

At the terminal pictured at the right, one Elwell-Parker electric truck and a system of platform skids save the labor of 10 men. In cash this means a reduction in labor cost of approximately $72 per day—$21,600 per year on a 300 day operation.

Because Elwell-Parker Tructors are made in self-loading, hauling and tiering types for marine terminal requirements . . . are adaptable to scores of different freight handling jobs . . . and cost little to operate, they have been favorites on the docks for many years.

Your nearest Elwell-Parker Engineer understands your needs. He will gladly give you facts and figures you can apply direct to your own situation. Call him—or write direct to Elwell-Parker in Cleveland for details.

Oversize motors, heavy in copper, take all the power the battery delivers. No fuses are necessary. Power failure at crucial moments is avoided. This, together with automatic control features protecting operator and truck, will interest your Safety Committee.

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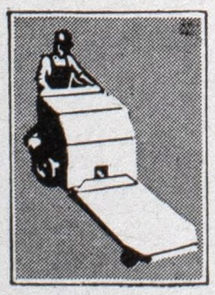


Tructors

These Remarkable Tubes

Slash Handling Costs

THE Exide-Ironclad Battery is absolutely different from any other battery. In the construction of this battery positive plates are used in which the active material is held in finely slotted rubber tubes.

These tubes permit the solution to pass freely through the slots, but the active material itself cannot readily escape. The action is similar to that of a tea ball dipped in a pot of boiling water. This construction accounts for the unusually long life of the battery.

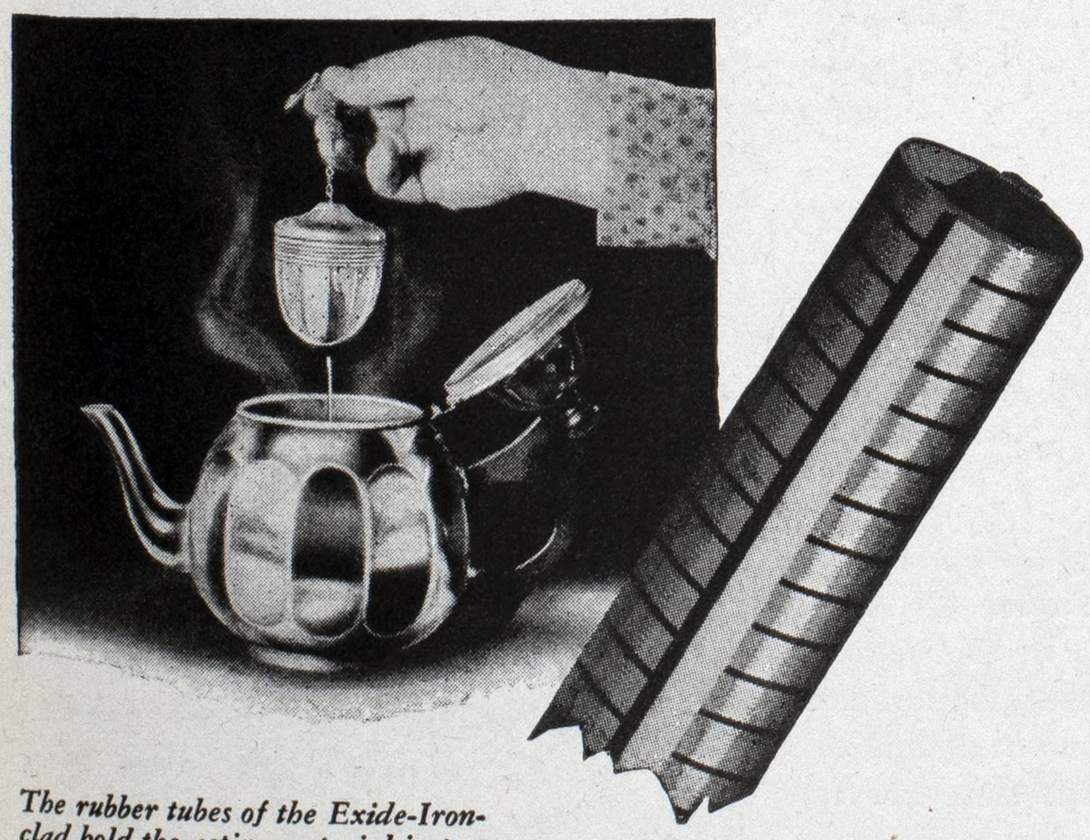
Exide's skilled engineers have designed Exide-Ironclad Batteries for trouble-free performance . . . to produce tremendous power when called upon to climb a steep grade or pull an extra-heavy load. That's why thousands of Exide-Ironclads are in use in industrial trucks and tractors today. When you want the utmost in battery value and efficiency, you gain these distinct advantages from Exide-Ironclads:—

1. The Exide-Ironclad is built to deliver and maintain a consistently high voltage throughout the day's work.
2. The Exide-Ironclad takes current quickly and easily — with little waste —at the charging panel.
3. The Exide-Ironclad is designed to give a steady, reliable flow of current throughout an unusually long life.
4. The Exide-Ironclad is made by the world's largest manufacturers of storage batteries for every purpose and backed by 42 years' experience in battery construction.

This is the famous positive plate of Exide-Ironclad Battery with its slotted rubber tube construction.

Write for "Facts"

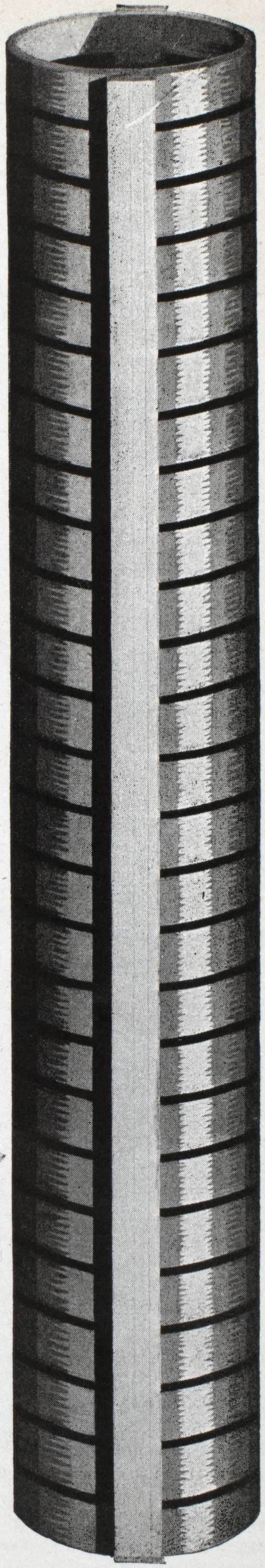
Write today for a copy of the booklet, "Facts for Consideration in Selecting a Storage Battery." Before buying your next battery ask for prices on dependable Exide-Ironclad Batteries.



The rubber tubes of the Exide-Ironclad hold the active material just as the tea ball holds the tea leaves.

This booklet will interest you. Send for it.

Exide
IRONCLAD
BATTERIES



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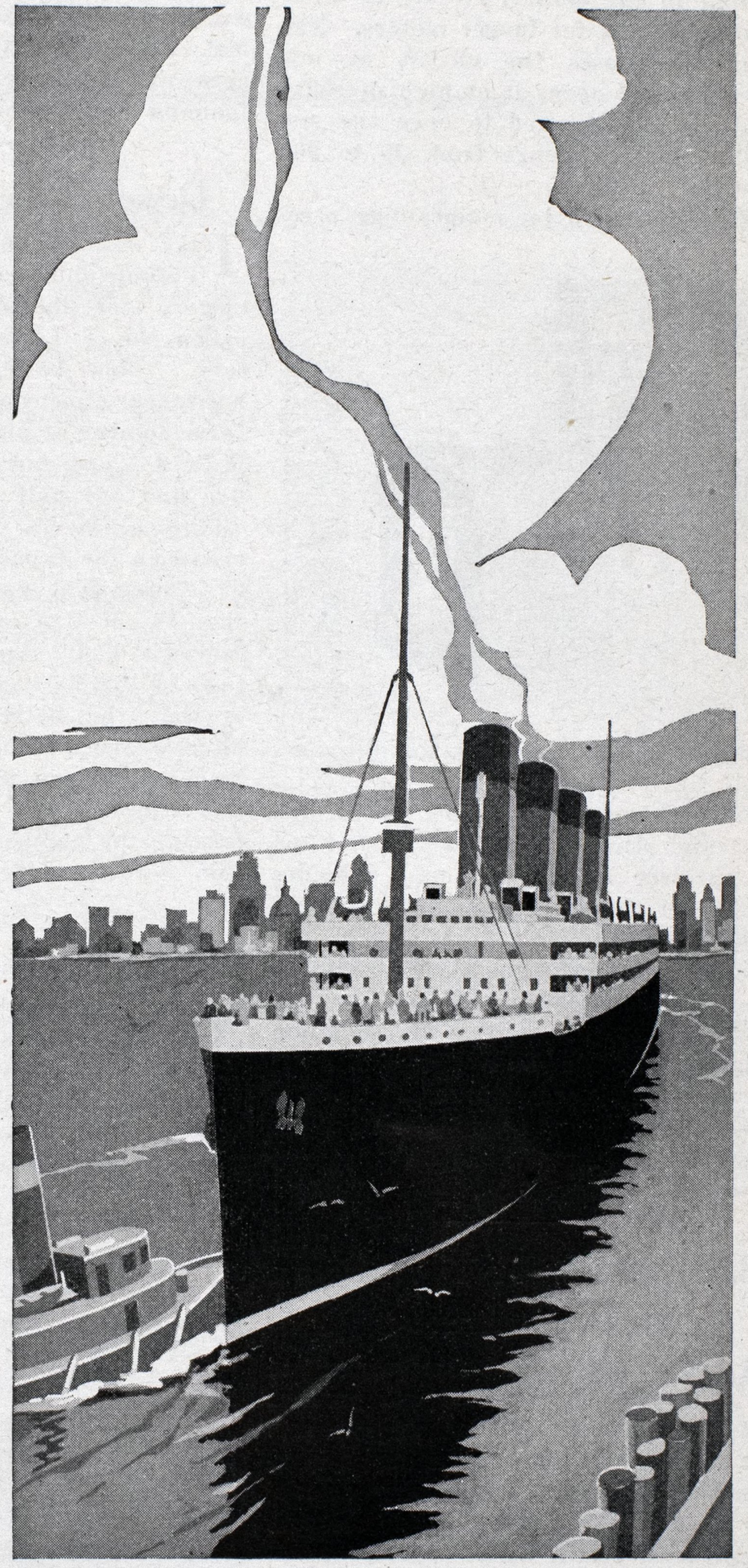

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The Most Widely Used and Best Known Directory on the Great Lakes

IT IS a complete list of vessels plying the Great Lakes, with the names of the owner, captain and engineer of each vessel.

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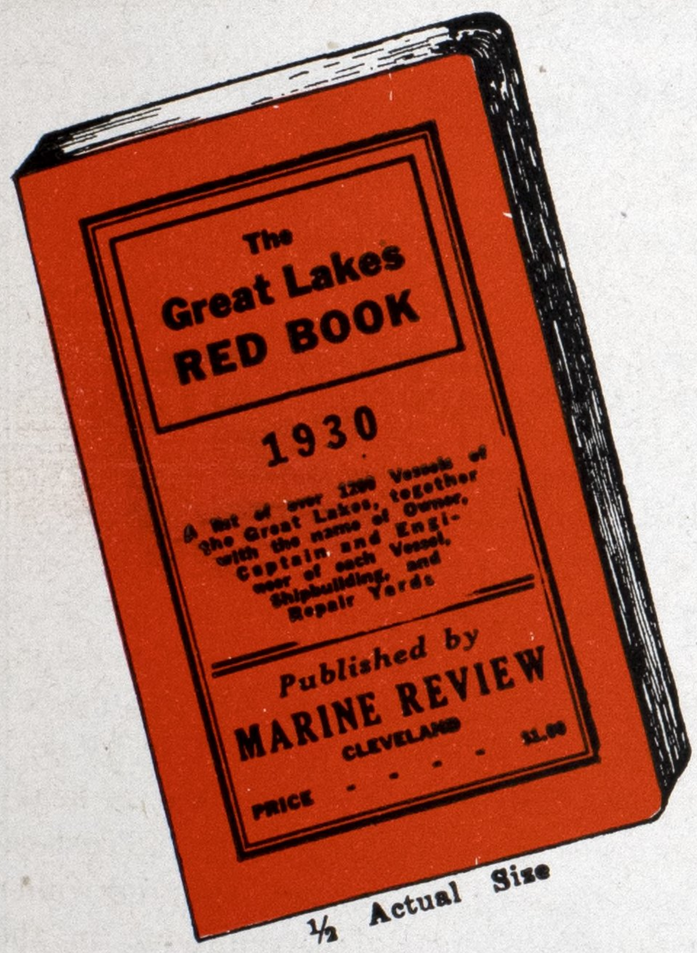

½ Actual Size

It also includes an accurate and complete directory of ship building and ship repair yards serving shipping on the Great Lakes. The officers as well as the building and repair facilities of these yards are listed.

Because of its convenient vest-pocket size, *The Great Lakes Red Book* is depended upon by vesselmen and others interested in *Great Lakes* trade, as the most complete, reliable and convenient directory of its kind.

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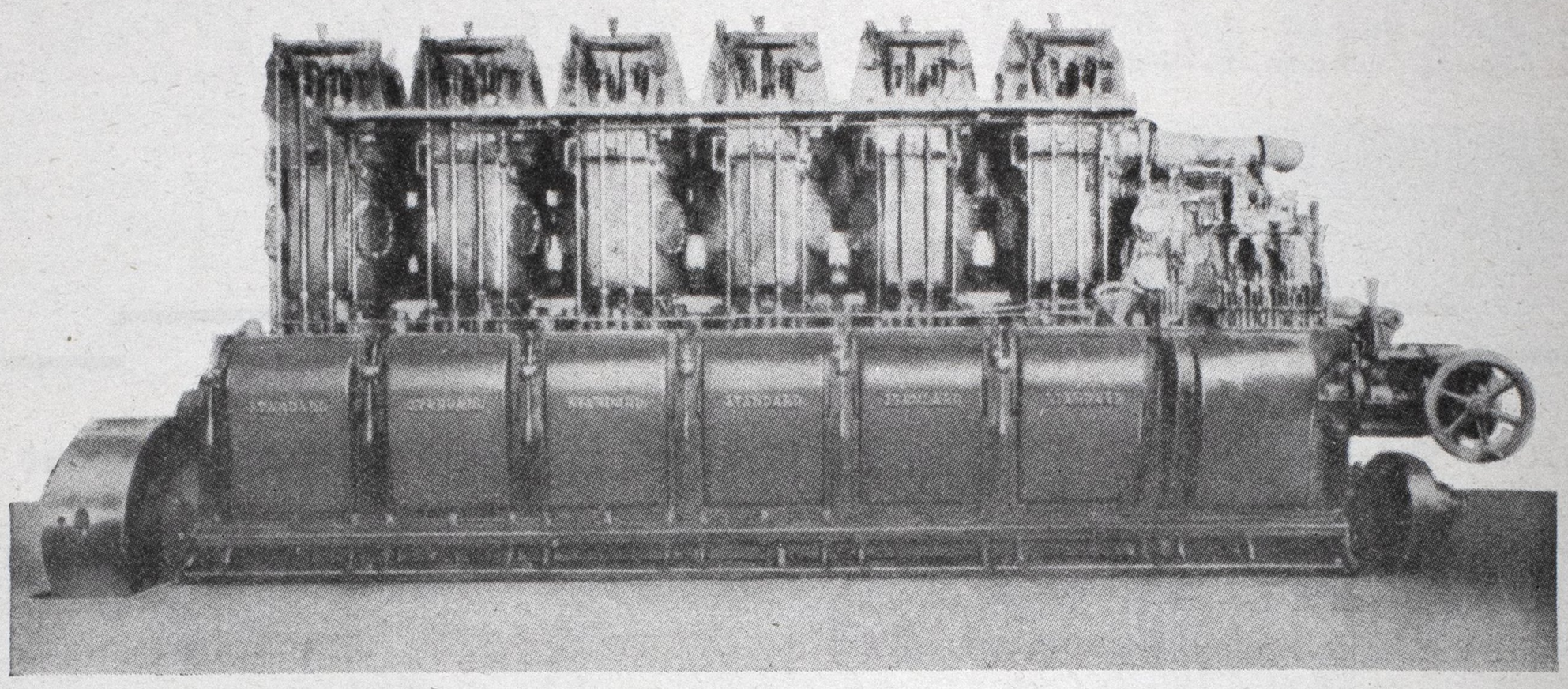
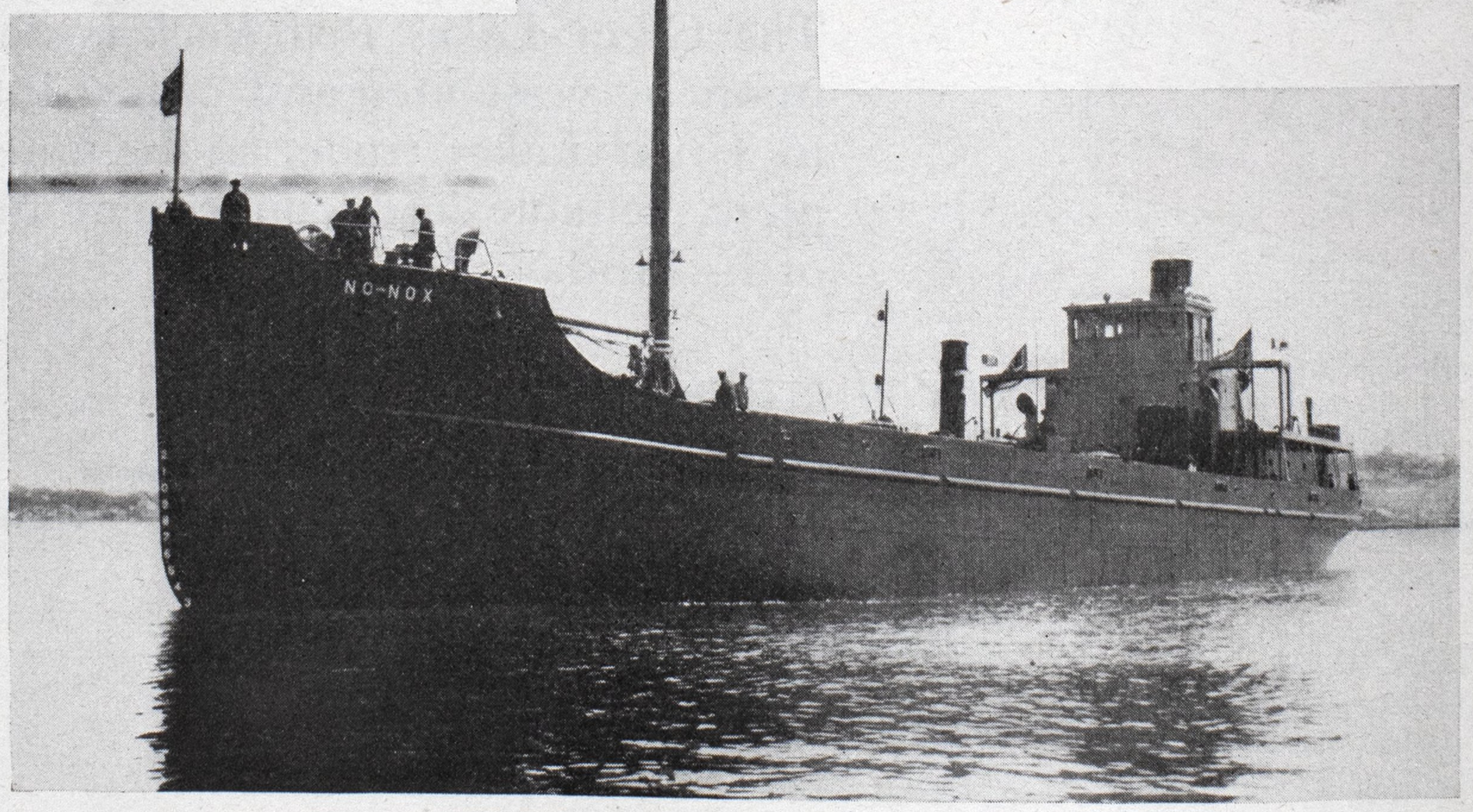


Two of these 330 H. P. Direct Reversible Diesels
Drive the Gulf Refining Co. Tanker "No-Nox" 9½ Knots.

Nothing Could Be More Reliable Than These Engines In The "No-Nox"....

Three 35 K. W. Standard Diesel Generating Sets Operate Perfectly In Parallel, Proving Perfect Governing.

If You Will Write To The STANDARD MOTOR CONSTRUCTION CO., 184 Whiton St., Jersey City, N. J., You May Obtain Quotations On Diesel Propelling and Auxiliary Engines of Outstanding Quality.



STANDARD DIESELS

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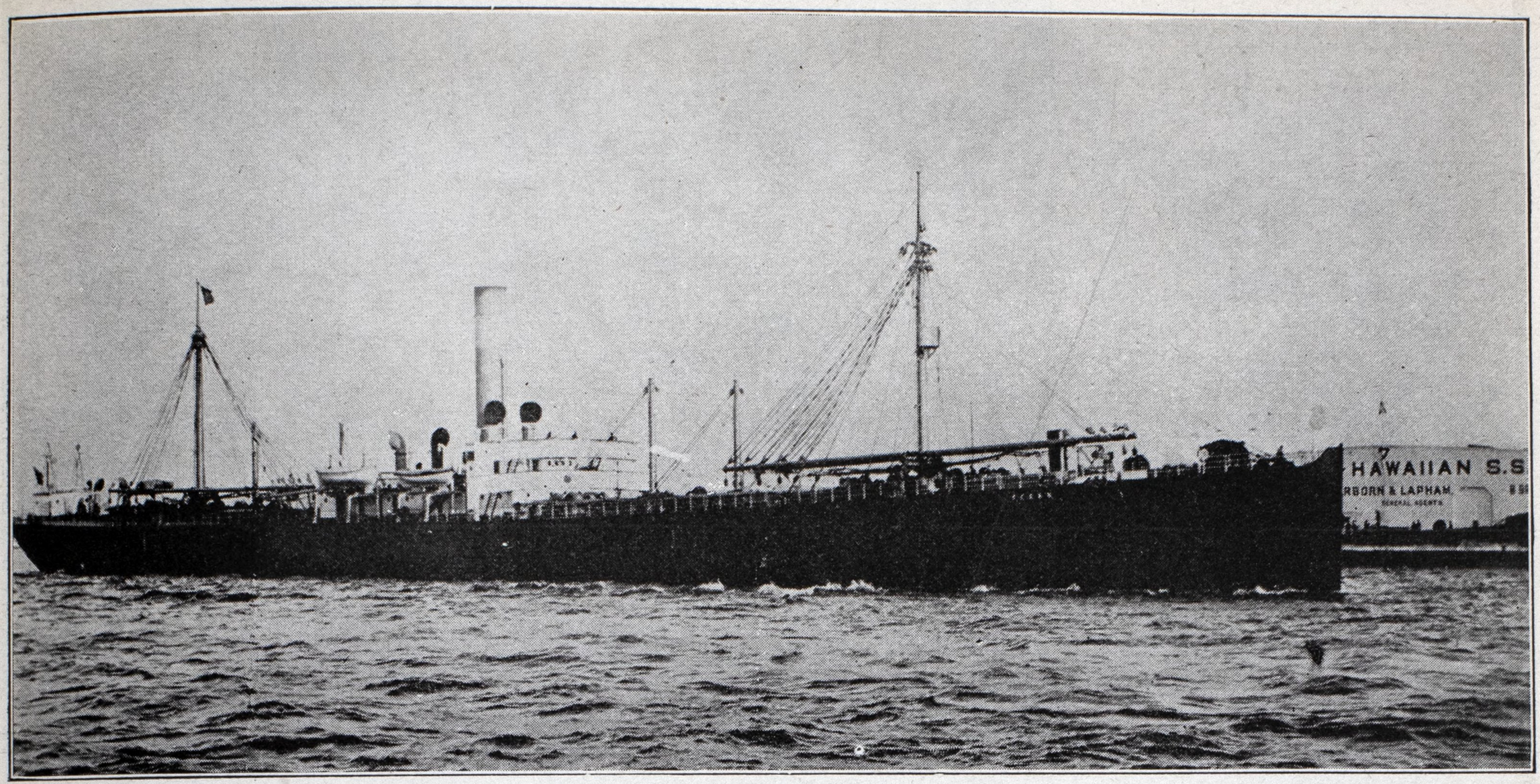

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Length, 484 ft. 3 in.; beam, 57 ft.; depth, 42 ft. 6 in.; draft, 29 ft. 2 in.; gross tons, 8615; I. H. P. 3535.

Built in 1902, this vessel is still in operation and is the most efficient, in point of fuel consumption, of any ship in the American Hawaiian Steamship Company's fleet.

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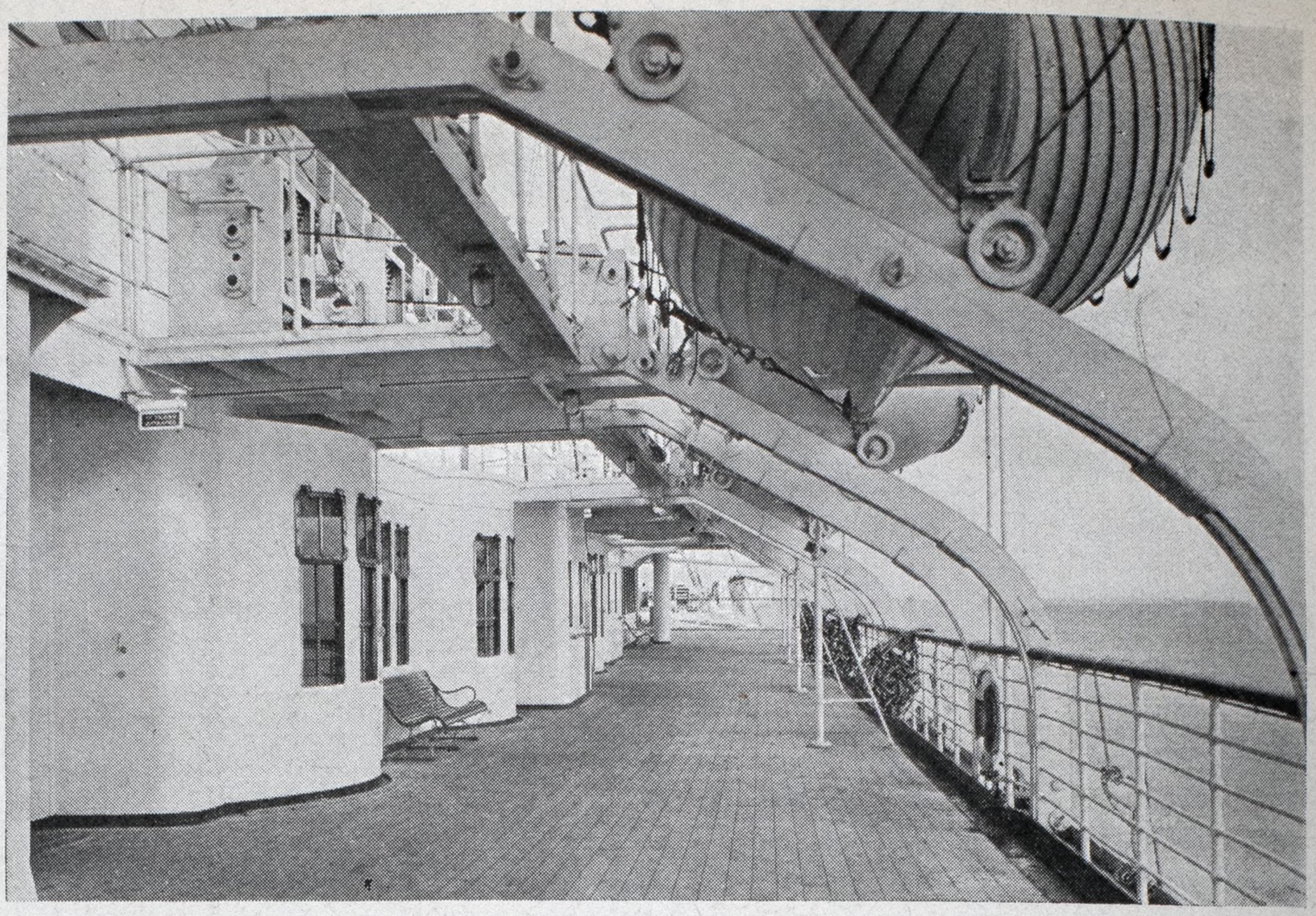

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The "Bracketless-System"

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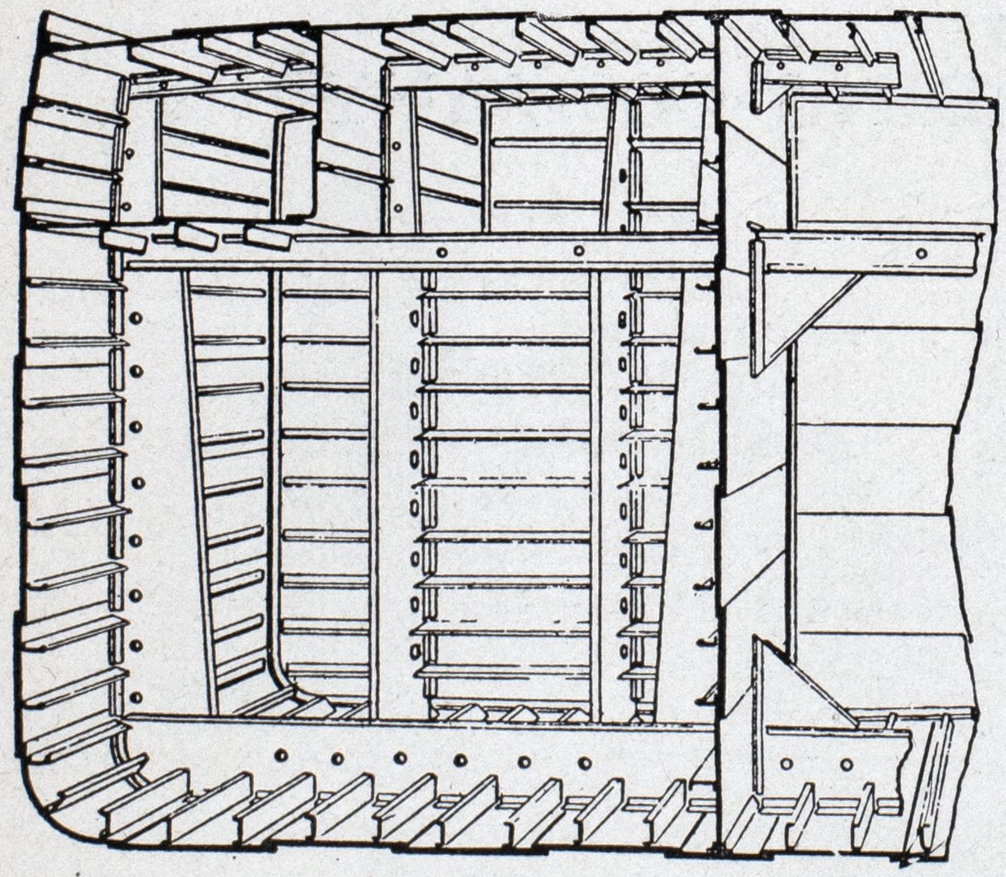

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Greatly Simplifies Construction
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Substantially Increases the Longitudinal Strength
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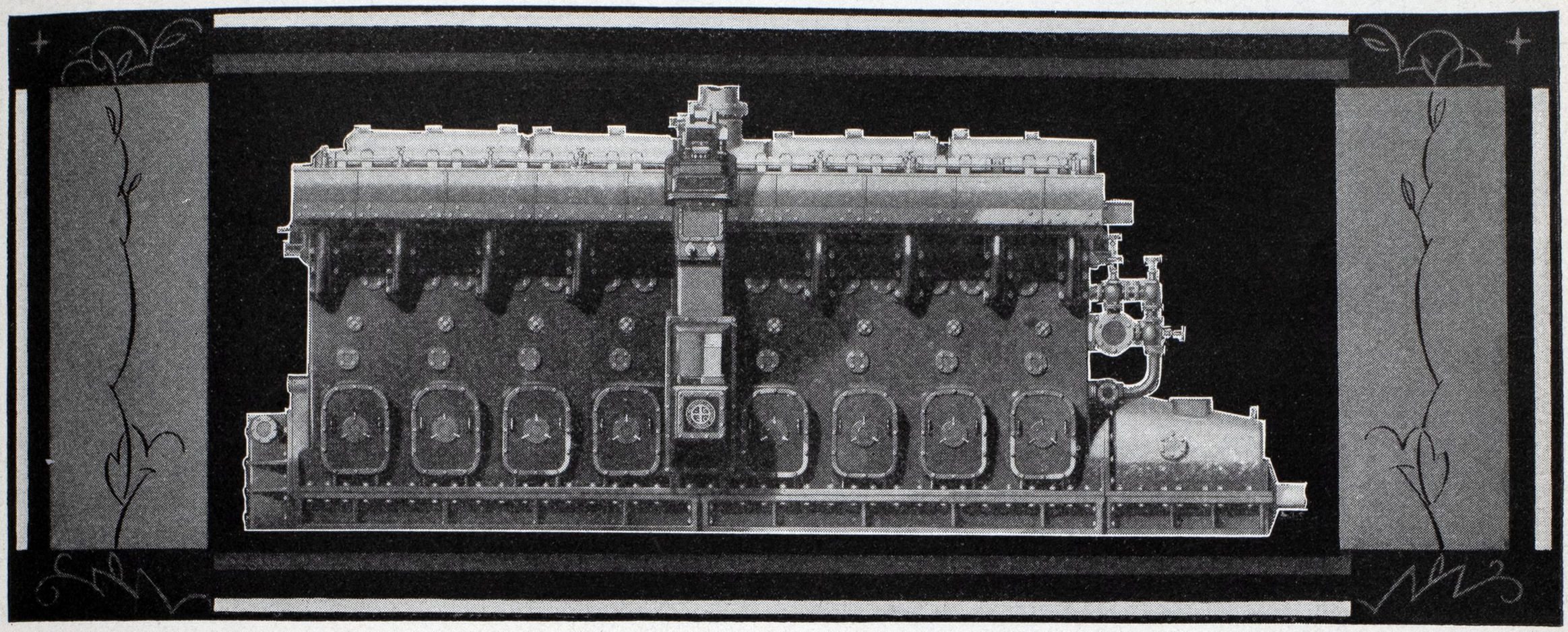
He Profits Most Who Serves Best



THE truth of this axiom is just as applicable to marine power plants as it is to red blooded human beings. A power plant that can give you a little better performance, a little more productive time, a little less trouble and a little more economy is one that will render you a vastly greater service than you can possibly attain with "just a piece of machinery."

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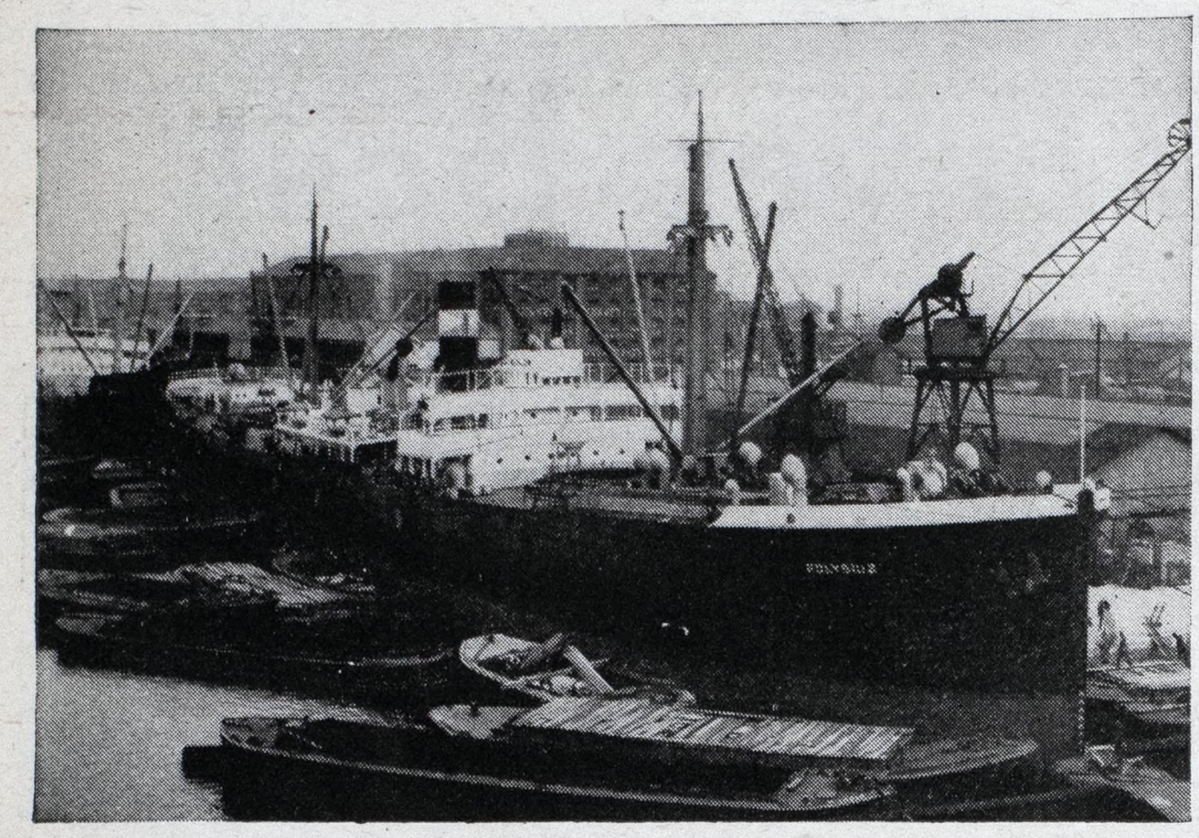
COOPER-BESSEMER

DIESEL MARINE ENGINES

A GIANT FLEET
to meet a GIANT need



An American Vessel at the Port of London

TODAY the United States dominates the markets of the world. Our manufactured products go to every corner of the earth. Never before have we so urgently needed swift, dependable ships to carry on our overseas commerce.

The new American Merchant Marine amply meets this need with a great fleet of speedy, modern American-flag ships. Made up of the hundreds of vessels in the 17 lines owned by the United States Shipping Board and those in the many others developed by the Shipping Board but now under private ownership, it offers American Business unrivalled transportation to every part of the world.

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**Accommodations available for a limited number of passengers on these lines*

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TRAVEL via LAKE ERIE

LET THE C & B LINE be your host between Cleveland and Buffalo or Cleveland and Port Stanley, Canada.

Beautiful scenery. Comfortable staterooms, luxurious cabins, wide decks. Excellent dining room service and courteous attendants. Music and dancing on the Great Ship "SEEANDBEE".

Autoists, save a day C & B Line way. Avoid miles and miles of congested roadway and rest while you travel.

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Steamers each way, every night, leaving at 9;00 p.m.; arriving 7:30 a.m. (E.S.T.) April 15th to Nov. 15th. **Fare $5.00 one way; $8.50 round trip. Autos carried $6.50 and up.**

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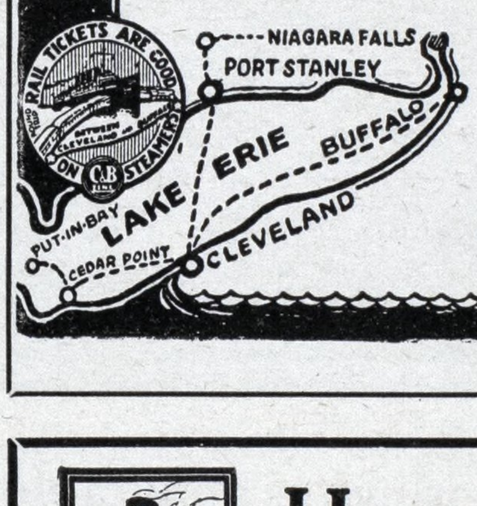
Steamer leaves Cleveland at midnight, arriving at Port Stanley, 6:00 a. m.; returning, leaves Port Stanley, 4:30 p. m. arriving at Cleveland, 9:30 p. m. (E. S. T.) June 20th to Sept. 6th. **Fare $3.00 one way; $5.00 round trip. Autos carried $4.50 and up.**



Write for details on Triangle, Circle and All Expense Tours; also 1930 Cruise de Luxe to Chicago via Sault Ste. Marie. Ask for free Auto Map and Folder No. 25.

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Passenger Services: New York to Cherbourg, Southampton and Hamburg. New York to Galway, Cobh (Queenstown), Cherbourg and Hamburg.

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On Board the . . .

On board the new Ward Liner, "Morro Castle" . . . on board the new Grace Liner, "Santa Clara" . . . on board the new American-South African Liner, "City of New York" . . . on board the new Coast Guard Cutters, "Itaska", "Sebago", "Saranac".

In fact, on board most all of the outstanding new ships—and the older ones—you will find Paracoil equipment holding responsible positions.

Paracoil Feed Water Heaters, Evaporators, Distillers, Lubricating Oil Coolers, etc., etc., have been standard marine equipment for many years.

Write for bulletins.

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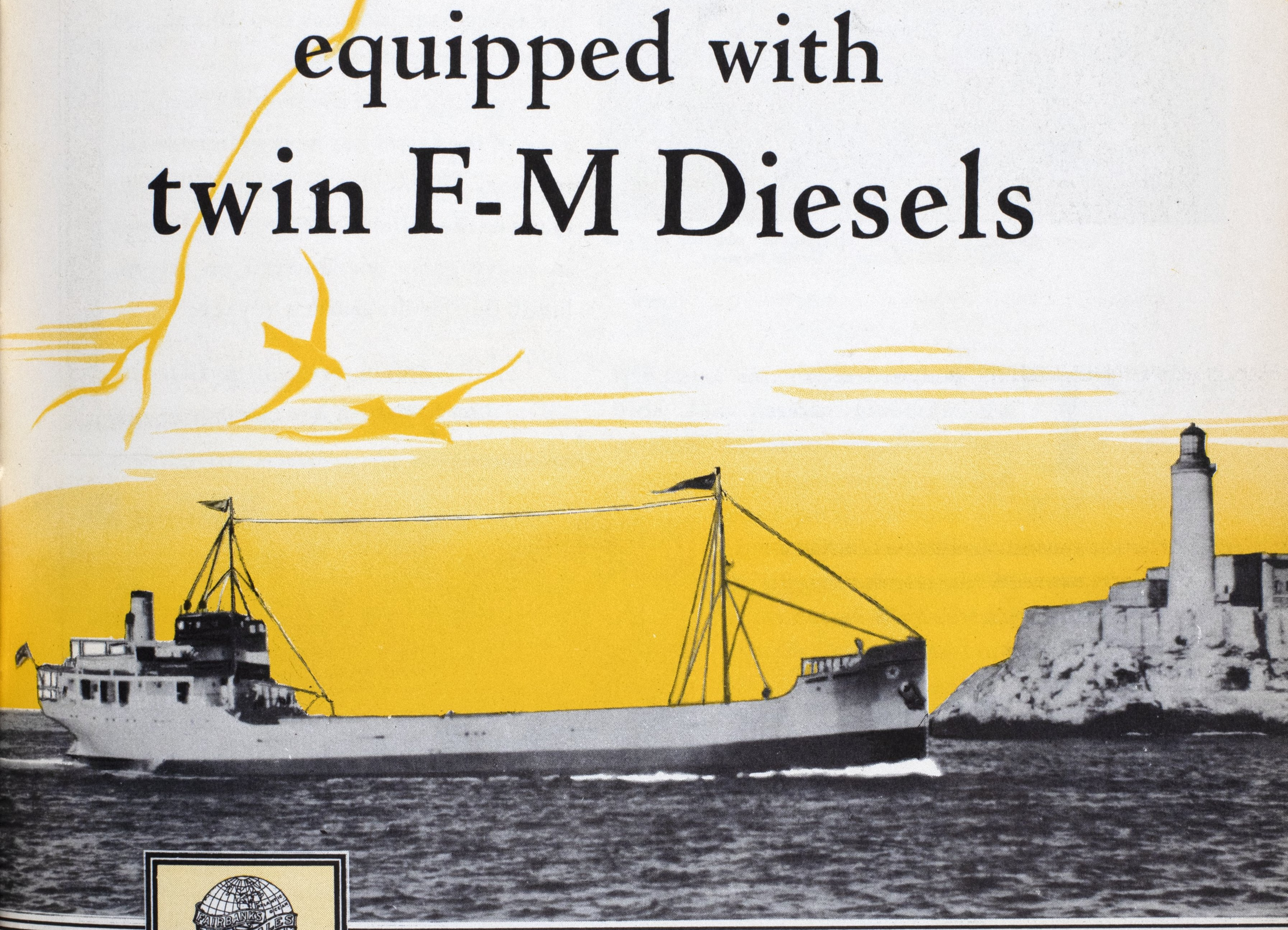
Seagoing cement carrier equipped with twin F-M Diesels



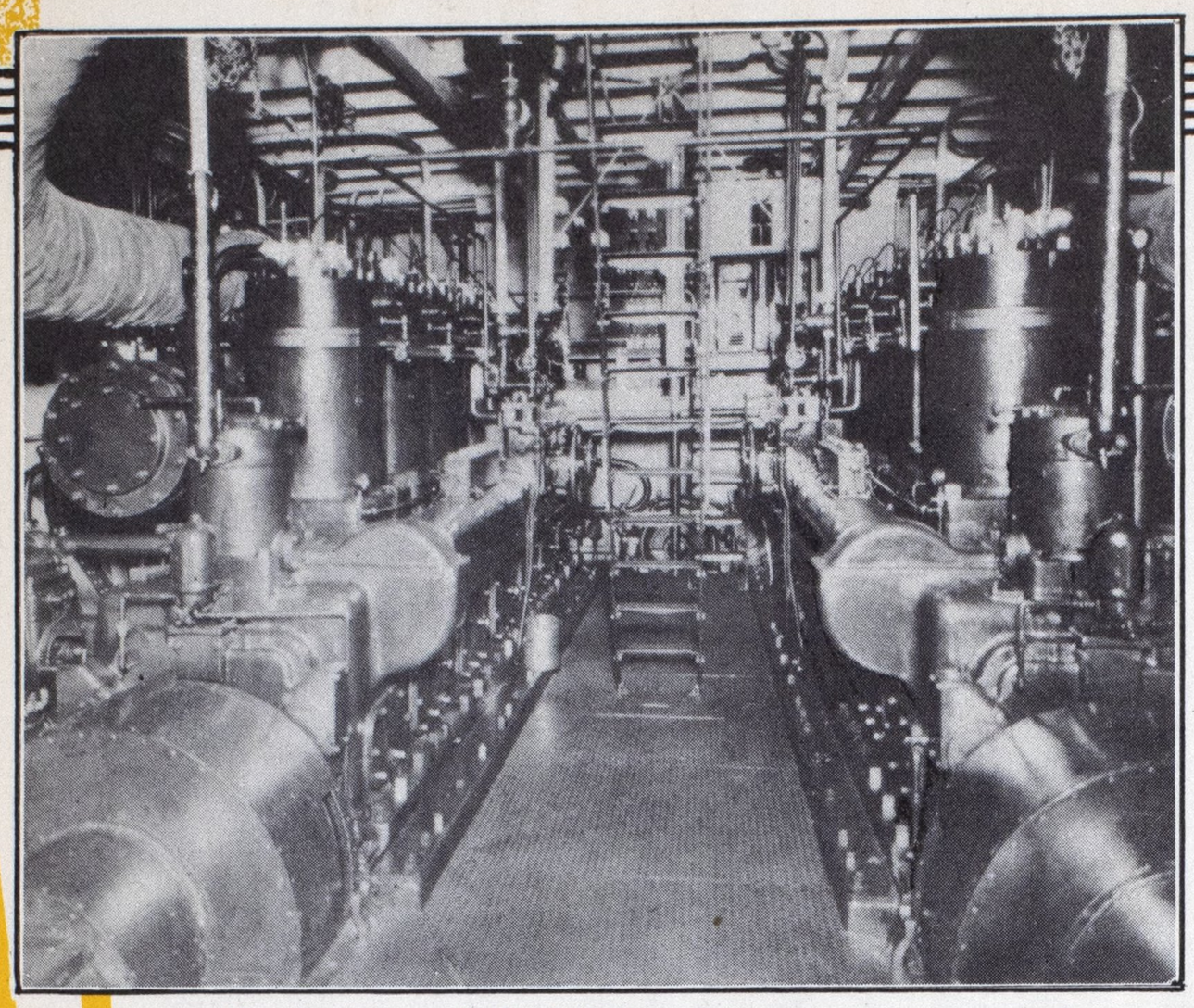
1930
begins the
SECOND CENTURY
of building
FAIRBANKS SCALES

The "Holger Struckmann" entering the harbor at Havana, Cuba, on completion of her transatlantic maiden voyage. The historic Morro Castle may be seen in the background.

{See Reverse Side}

FAIRBANKS-MORSE
DIESEL ENGINES
POWER, PUMPING AND WEIGHING EQUIPMENT

{Continued from preceding page}



Engine room of the "Holger Struckmann" showing her two 400 hp. F-M Model 35 Diesel Engines.

THE "Holger Struckmann" is the first self-unloading cement tank ship used in seagoing service. Built in Aalborg, Denmark, by The Aalborg Maskin & Skibsbyggeri for the International Cement Corporation, the vessel is used regularly in Cuban waters. Bulk cement is carried in 200 ton compartments and is unloaded by means of patent pumps.

Dependable, economical power is supplied by twin 6-cylinder, 400 hp. Fairbanks-Morse Diesel Engines. Auxiliary equipment includes two 20 kw. F-M Diesel generating sets.

According to the owners, the performance of the vessel has been extremely satisfactory. Particular mention has been made of the reliability of the F-M Diesels in heavy gales encountered on the Atlantic during the maiden voyage.

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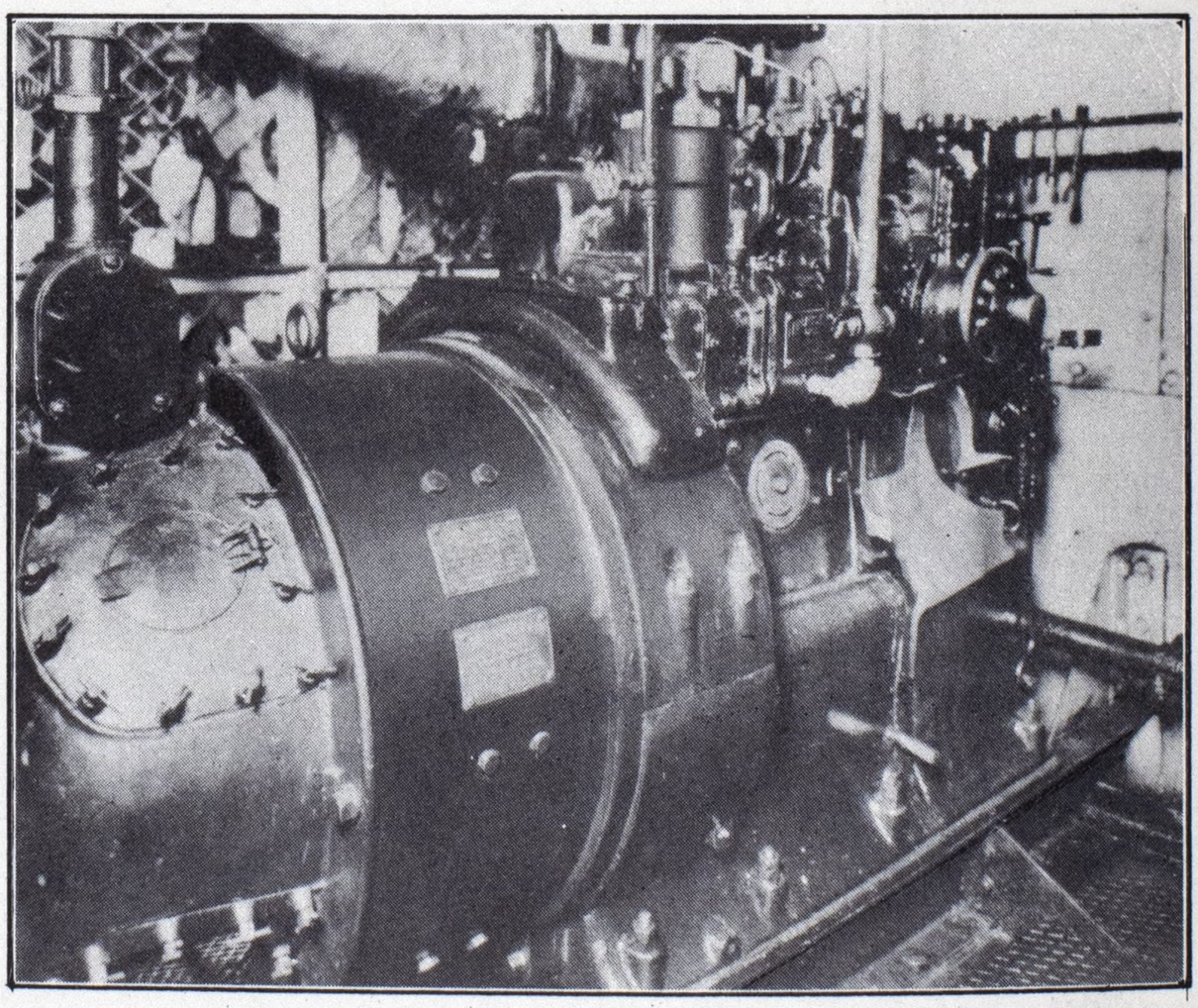

One of the two 20 kw. Fairbanks-Morse Diesel generating sets on the "Holger Struckmann."

FAIRBANKS SCALES

1930
begins the
SECOND CENTURY
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FAIRBANKS-MORSE
DIESEL ENGINES
POWER, PUMPING AND WEIGHING EQUIPMENT

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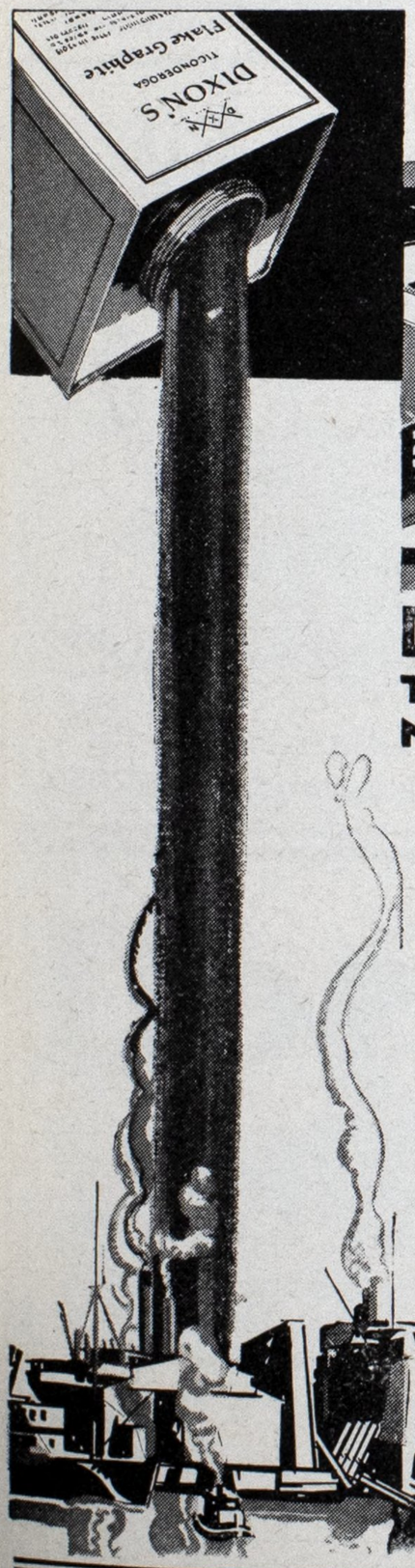

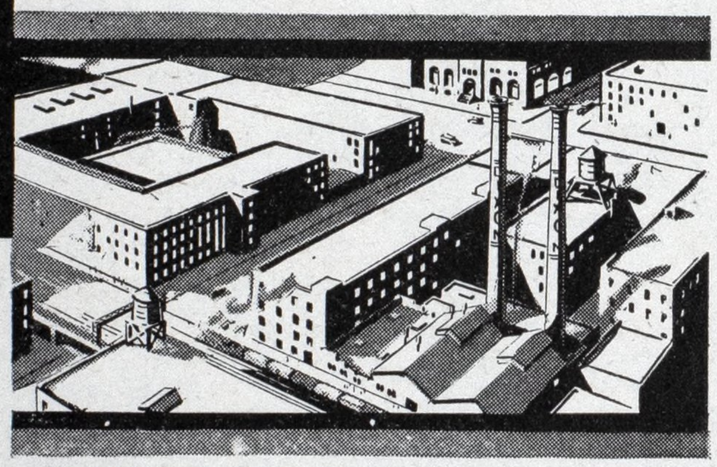

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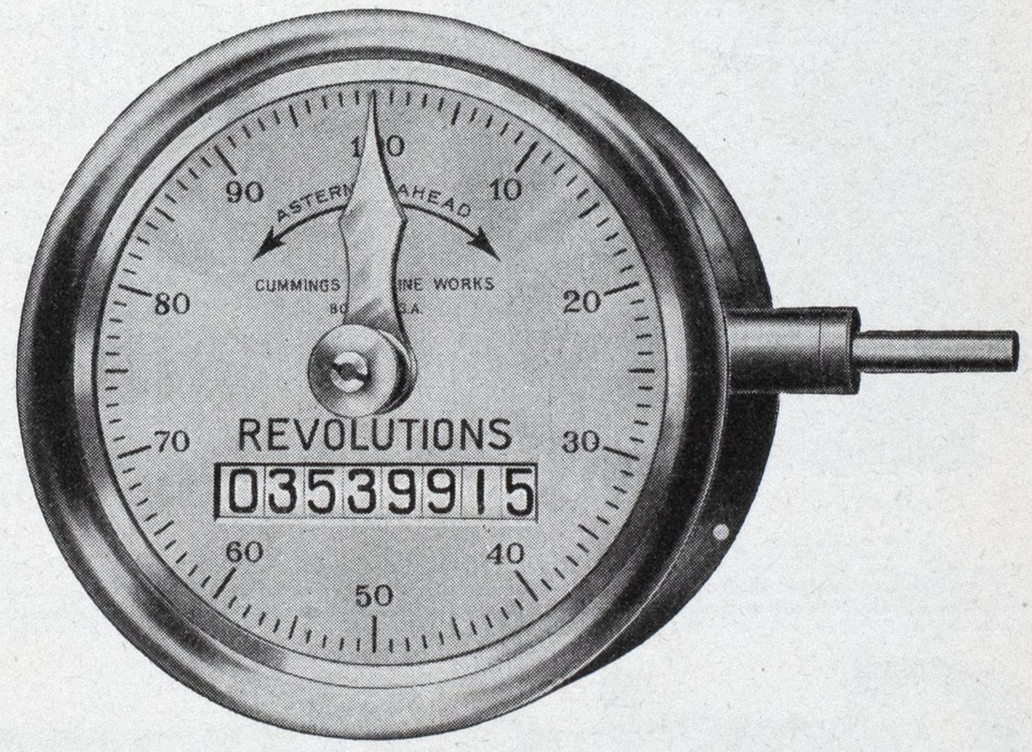

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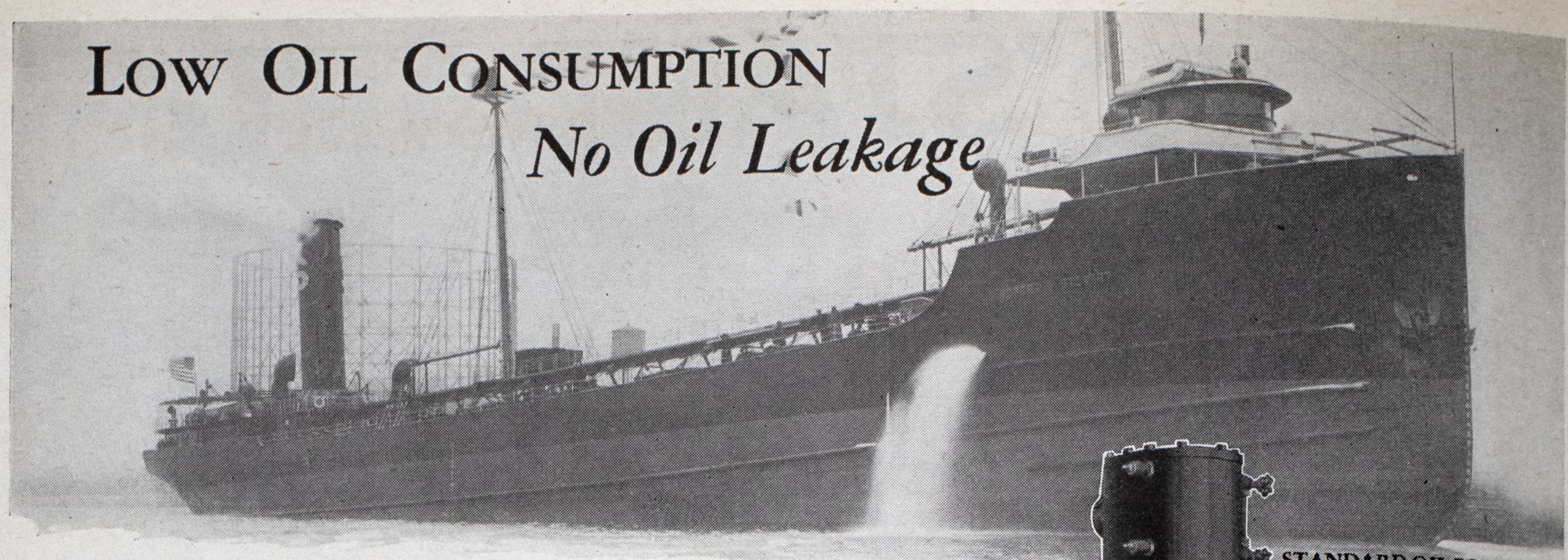

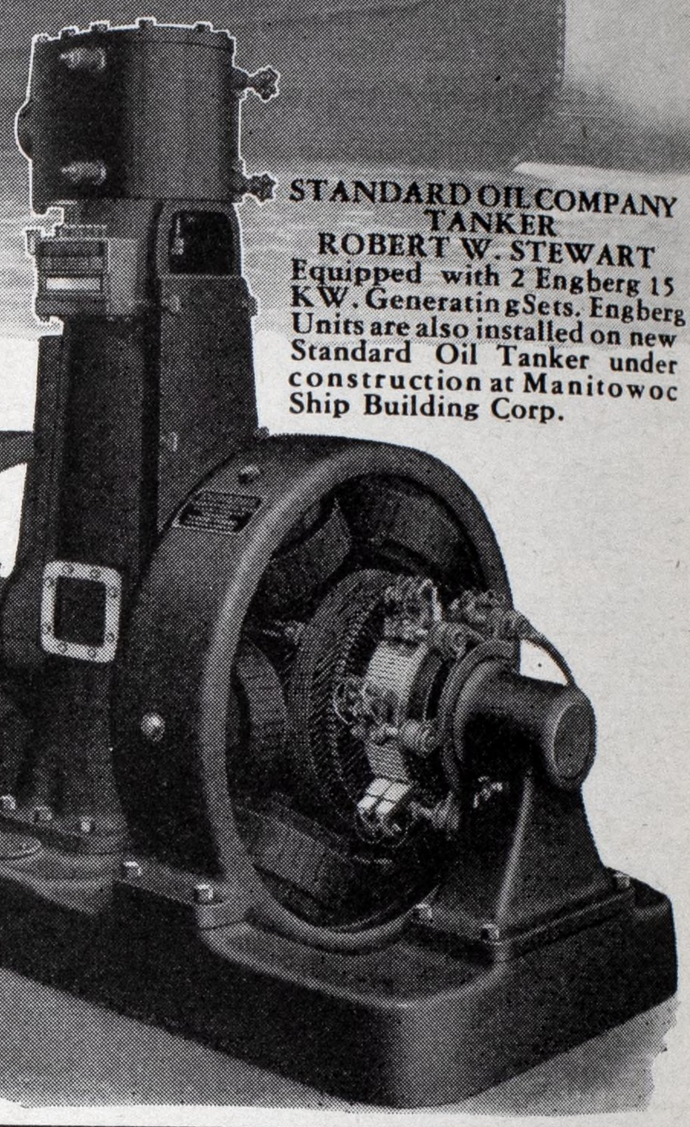

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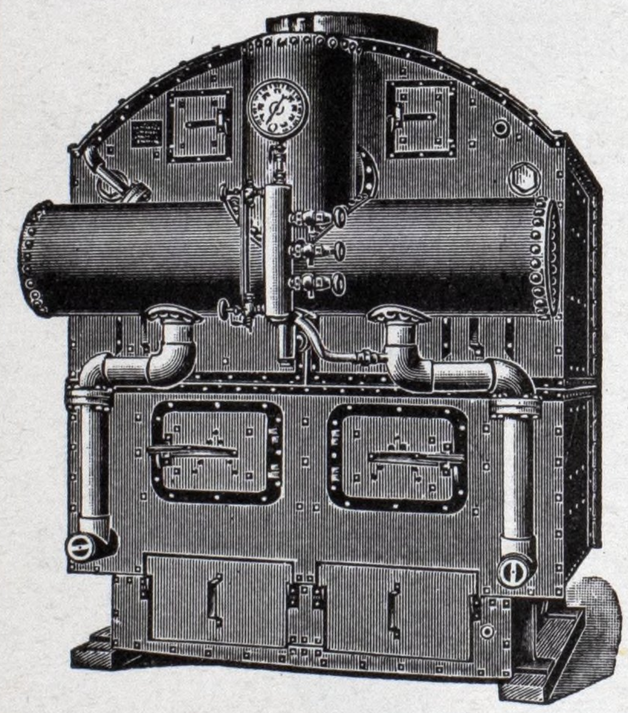

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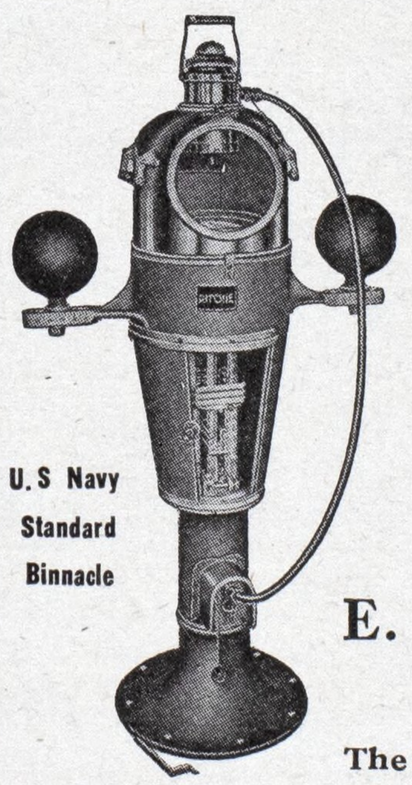

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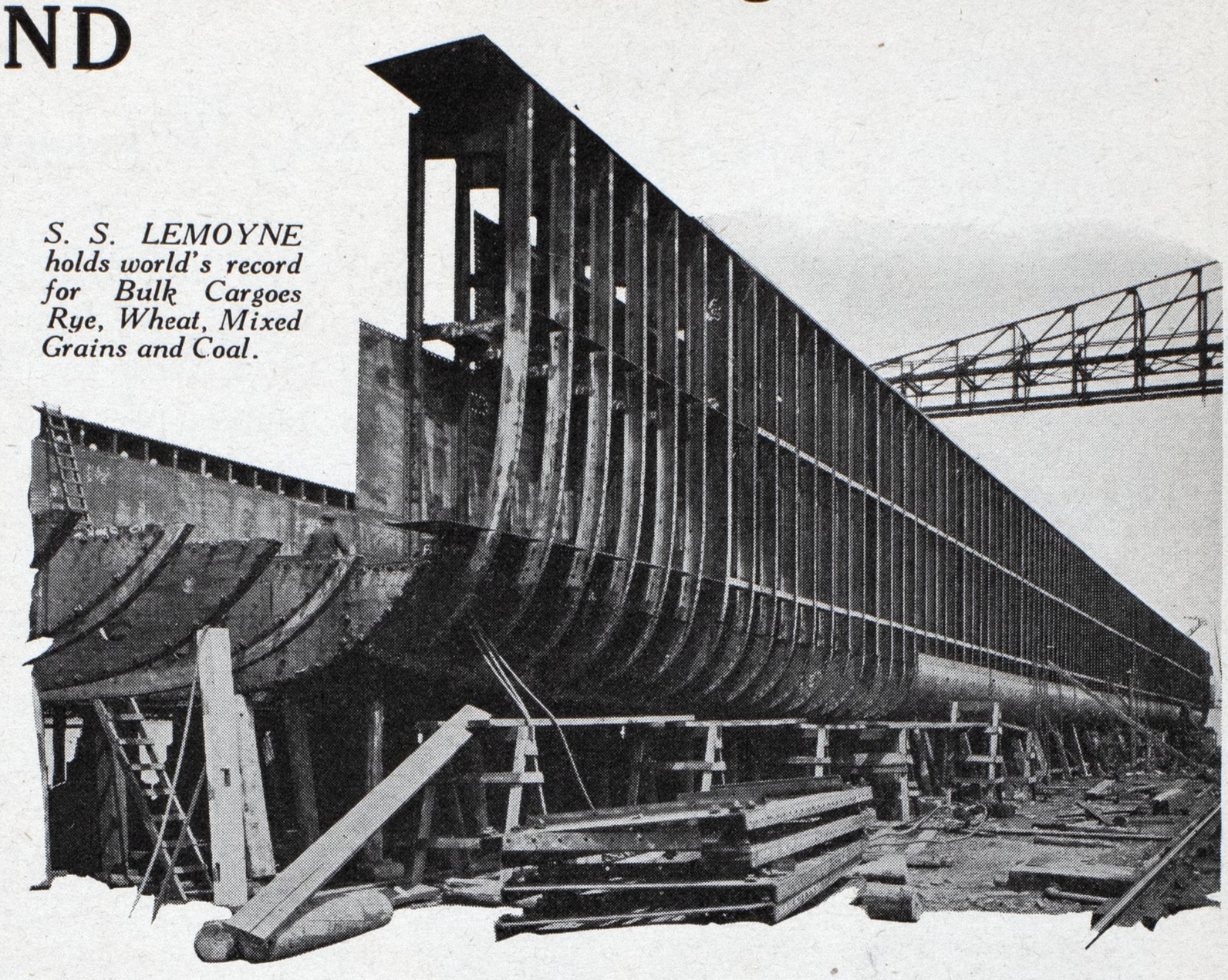

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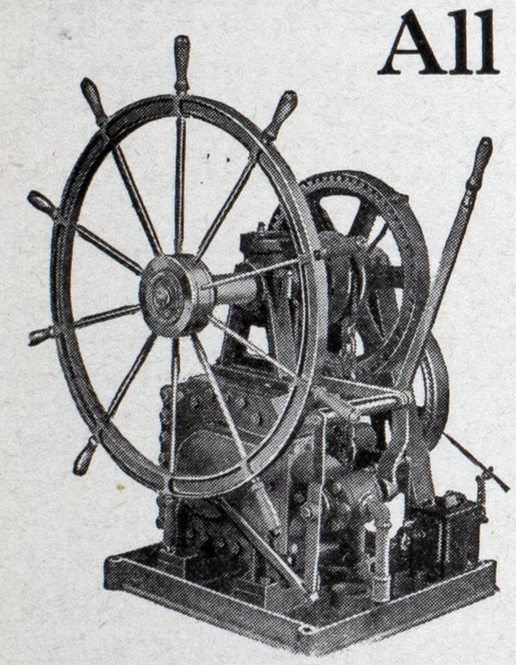

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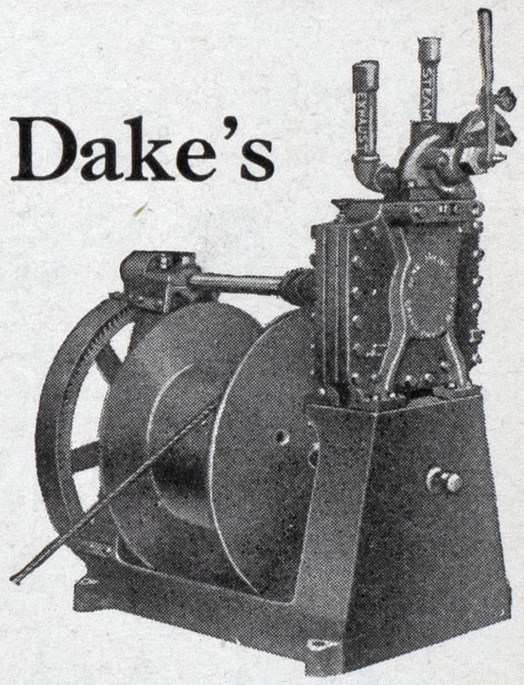
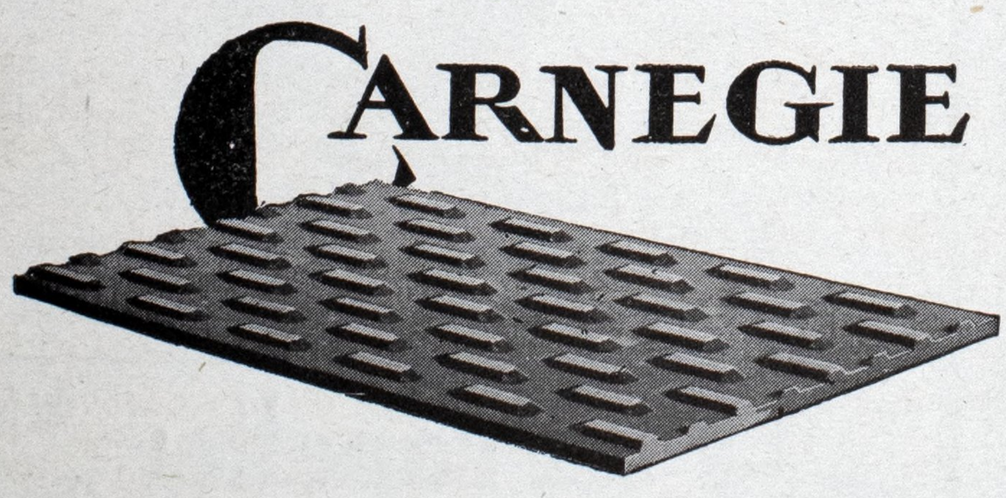


Snub Line Winch

CARNEGIE FLOOR PLATE



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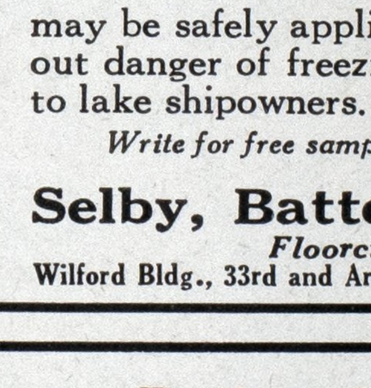

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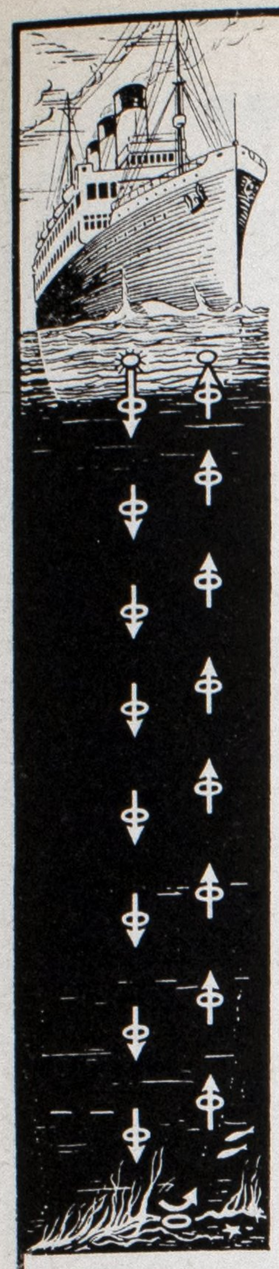

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Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.

DREDGING MACHINERY
Great Lakes Engineering Works,
River Rouge, Mich.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

DRINKING FOUNTAINS
Haydenville Co., The,
Haydenville, Mass.
Great Lakes Engineering Works,
River Rouge, Mich.
Los Angeles Shipbuilding & Dry
Dock Corp., San Pedro, Cal.
Manitowoc Ship Building Corp.,
Manitowoc, Wis.
Maryland Dry Dock Co.,
Baltimore, Md.
Newport News Shipbuilding & Dry
Dock Co., 233 Broadway,
New York City.
New York Shipbuilding Co.,
Camden, N. J.
Sun Shipbuilding & Dry Dock Co.,
Chester, Pa.
Todd Shipyards Corp.,
25 Broadway, New York City.
Toledo Shipbuilding Co., Toledo, O.

DYNAMOS
Engberg Division of Troy Engine &
Machine Co., 2229 Vine St.,
St. Joseph, Mich.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

EJECTORS (Ash)
Great Lakes Engineering Works,
River Rouge, Mich.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

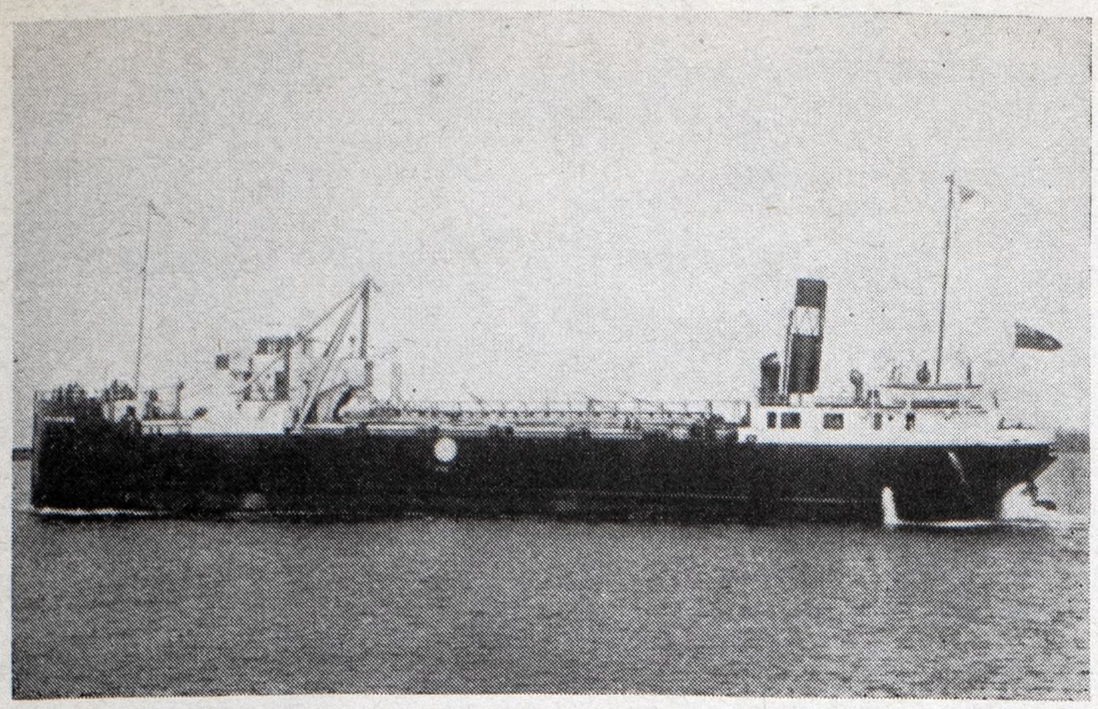
ENGINE SPEED INDICATORS
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

ENGINEERS (Marine, Mechanical and Consulting)
Canada Steamship Co.,
P. O. Box 2430, Montreal, Can.
Crandall Engineering Co.,
Cambridge, Mass.
Great Lakes Engineering Works,
River Rouge, Mich.
Todd Shipyards Corp.,
25 Broadway, New York City.
United Dry Docks, Inc.,
11 Broadway, New York City.

ENGINES
Busch-Sulzer Bros.-Diesel Engine Co.,
2nd and Utah Sts., St. Louis, Mo.
Cooper-Bessemer Corp., The,
Grove City, Pa.
Electric Boat Co.-New London Ship
& Engine Works, 247 Park Ave.,
New York City.
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.
Standard Motor Construction Co.,
172 Whiton St.,
Jersey City, N. J.
Sun Shipbuilding & Dry Dock Co.,
Chester, Pa.

ENGINES (Diesel)
Busch-Sulzer Bros.-Diesel Engine Co.,
2nd and Utah Sts., St. Louis, Mo.
Cooper-Bessemer Corp., The,
Grove City, Pa.
Electric Boat Co.-New London Ship
& Engine Works, 247 Park Ave.,
New York City.
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.
Ingersoll-Rand Co.,
11 Broadway, New York City
Standard Motor Construction Co.,
172 Whiton St.,
Jersey City, N. J.
Sun Shipbuilding & Dry Dock Co.,
Chester, Pa.

ENGINES (Internal Combustion)
Busch-Sulzer Bros.-Diesel Engine Co.,
2nd and Utah Sts., St. Louis, Mo.
Cooper-Bessemer Corp., The,
Grove City, Pa.
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.
Standard Motor Construction Co.,
172 Whiton St., Jersey City, N. J.



Steamship BULKARIER

Equipped with

Leathem D. Smith Self-unloading System

handling bulk cement and crude gypsum in Gulf of St. Lawrence.

LEATHEM D. SMITH DOCK COMPANY

205 W. Wacker Drive
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Plant Location
Sturgeon Bay, Wis.

LOS ANGELES

SHIPBUILDING & DRYDOCK CORPORATION

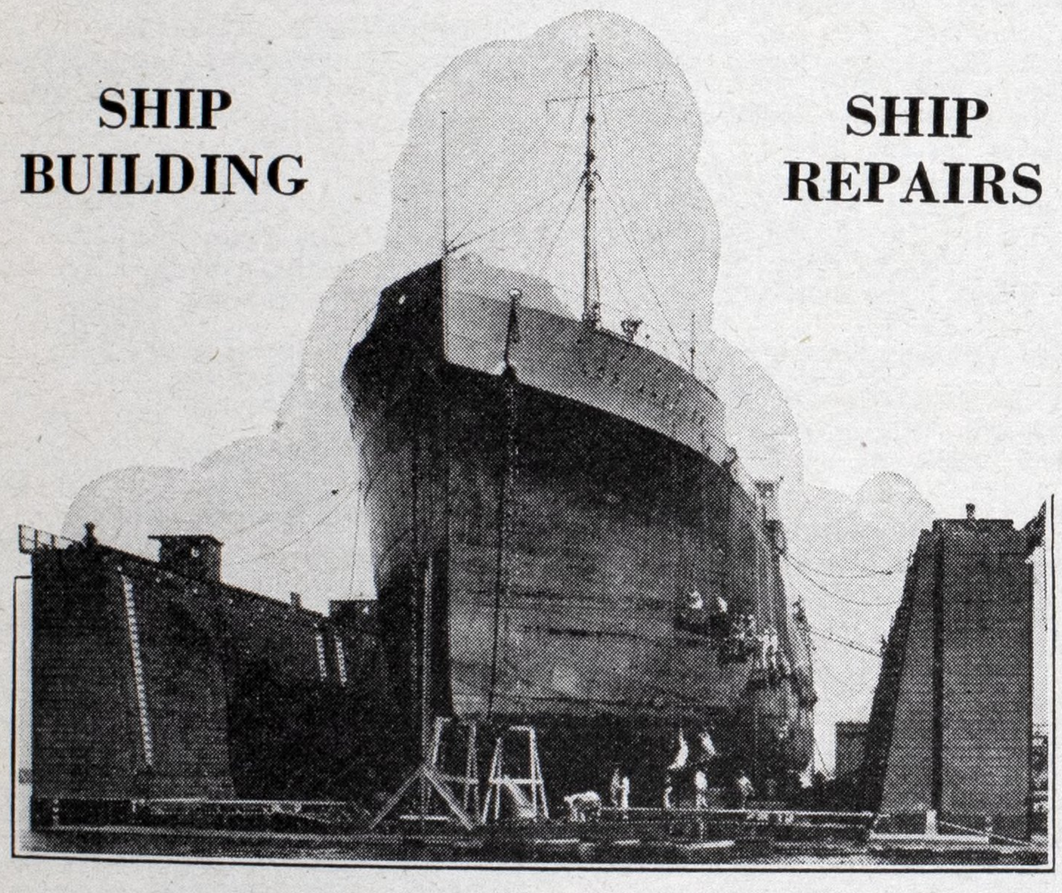
SAN PEDRO, CALIFORNIA

40 Acres of Modern Shipbuilding Equipment To Meet Every Requirement

Floating Drydock—12,000 Tons Capacity

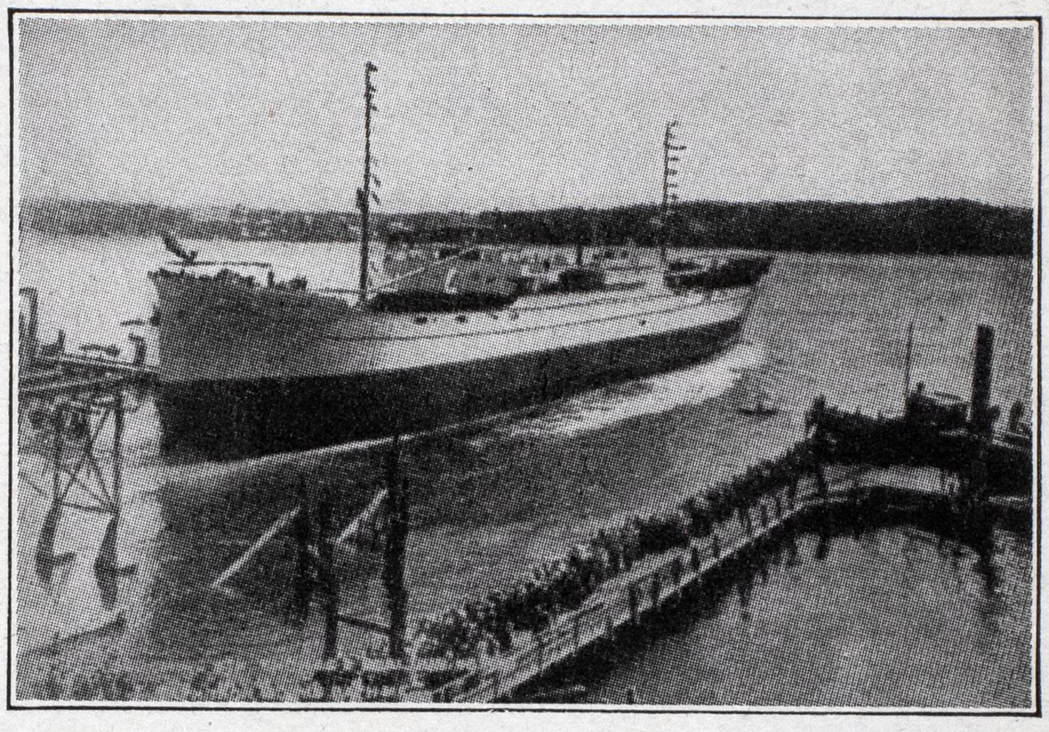
SHIP BUILDING

SHIP REPAIRS



BATH IRON WORKS

Launching 425 ft. steel Steamship



Years of experience in design and building water craft, have won for Bath Iron Works an enviable reputation. Sound materials straight thru, expert designing, conscientious workmanship—these are features of every vessel that leaves the docks of the Bath Iron Works.

- 1 -

Inquiries Solicited

BATH IRON WORKS CORP.

SHIPBUILDERS AND ENGINEERS

BATH, MAINE, U. S. A.

Baltimore City Office
310 E. Lombard St.
Plaza 1935

New York Office
No. 1 Broadway
Digby 3940

The Maryland Dry Dock Company

BALTIMORE, MD.

Drydocking, Shipbuilding and Ship Repairs of All Kinds

The Most Modern Shops in Baltimore **2—9000 Ton Floating Drydocks**

Floating Machine Shop

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Plant Phones: Curtis 0500 - 0501 - 0502 - 0503

ENGINES (Marine)
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland.
Bethlehem Shipbuilding Corp.,
Bethlehem, Pa.
Busch-Sulzer Bros.-Diesel Engine Co.,
2nd and Utah Sts., St. Louis, Mo.
Canada Steamship Lines,
P. O. Box 2430, Montreal, Can.
Cooper-Bessemer Corp., The,
Grove City, Pa.
Electric Boat Co.-New London Ship & Engine Works, 247 Park Ave.,
New York City.
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.
Ingersoll-Rand Co.,
11 Broadway, New York City.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway,
New York City.
New York Shipbuilding Co.,
Camden, N. J.
Sturtevant, B. F., Co., Inc.,
Hyde Park, Boston, Mass.
Sun Shipbuilding & Dry Dock Co.,
Chester, Pa.
Todd Shipyards Corp.,
25 Broadway, New York City
Toledo Shipbuilding Co., Toledo, O.
United Dry Docks, Inc.,
11 Broadway, New York City.

ENGINES (Oil)
Busch-Sulzer Bros.-Diesel Engine Co., 2nd and Utah Sts.,
St. Louis, Mo.
Cooper-Bessemer Corp., The,
Grove City, Pa.
Electric Boat Co.-New London Ship & Engine Works, 247 Park Ave.,
New York City.
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.
Ingersoll-Rand Co.,
11Broadway, New York City.
Standard Motor Construction Co.,
172 Whiton St.,
Jersey City, N. J.
Sun Shipbuilding & Dry Dock Co.,
Chester, Pa.

ENGINES (Steam, Steering)
Dake Engine Co.,
Grand Haven, Mich.

ENGINES (Vertical, Enclosed, Self Oiling)
Engberg Division of Troy Engine & Machine Co., 2229 Vine St.,
St. Joseph, Mich.

EUROPEAN STEAMSHIP LINES (Passenger and Freight)
Hamburg-American Line
39 Broadway, New York City.

EVAPORATORS
Griscom-Russell Co.,
285 Madison Ave., New York City.

FANS (Electric)
General Electric Co.,
Schenectady, N. Y.
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

FEED WATER HEATERS—See HEATERS AND PURIFIERS (Feed Water)

FEED WATER REGULATORS
Babcock & Wilcox Co.,
85 Liberty St., New York City.

FLOORING
Selby, Battersby & Co.,
33rd & Arch Sts., Philadelphia.

FLOOR PLATES
Carnegie Steel Co.,
Carnegie Bldg., Pittsburgh, Pa.

FORGING BILLETS
Heppenstall Co.,
46th & A.V.R.R., Pittsburgh, Pa.

FORGINGS
Heppenstall Co.,
46th & A.V.R.R., Pittsburgh, Pa.

FOUNDERS
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland, O.
New York Shipbuilding Co.,
Camden, N. J.

FREIGHT SERVICE
Hamburg-American Line,
39 Broadway, New York City.

FUEL OIL
Standard Oil Co. of New Jersey,
26 Broadway, New York City.
Vacuum Oil Co.,
61 Broadway, New York City.

FURNITURE
Marble & Shattuck Chair Co.,
10200 Foster Ave., Cleveland, O.

FURNITURE (Metal)
Simmons Co., The, 666 Lake Shore Drive, Chicago, Ill.

GALLEY RANGES
Stamford Foundry Co.,
Stamford, Conn.

GEARS (Marine Equipment)
General Electric Co.,
Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

GENERATING SETS
Engberg Division of Troy Engine & Machine Co., 2229 Vine St.,
St. Joseph, Mich.
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.

GENERATING SETS (Direct Connected)
Engberg Division of Troy Engine & Machine Co., 2229 Vine St.,
St. Joseph, Mich.
General Electric Co.,
Schenectady, N. Y.
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

GENERATORS
Engberg Division of Troy Engine & Machine Co., 2229 Vine St.,
St. Joseph, Mich.
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

GRAPHITE
Dixon, Jos., Crucible Co.,
Jersey City, N. J.

GRAPHITE GREASES
Dixon, Jos., Crucible Co.,
Jersey City, N. J.

GRAPHITE PAINT
Dixon, Jos., Crucible Co.,
Jersey City, N. J.

GRAPHITE PIPE JOINT COMPOUNDS
Dixon, Jos., Crucible Co.,
Jersey City, N. J.

GREASE
Vacuum Oil Co.,
61 Broadway, New York City.

GREASE (Launching)
Vacuum Oil Co.,
61 Broadway, New York City

GYPSEYS
American Engineering Co.,
Cumberland & Arimingo Sts.,
Philadelphia, Pa.

GYRO-PILOT (Automatic Steering)
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

HAMMER RAMS
Heppenstall Co.,
46th & A.V.R.R., Pittsburgh, Pa.

HATCH FASTENERS
Mullholland Hatch-Fastener Co.,
Marion Bldg., Cleveland, O.

HAWSERS (Manila)
Columbian Rope Co., Auburn, N. Y.
Samson Cordage Works, Boston.
Whitlock Cordage Co.,
46 South St., New York City.

HEATERS AND PURIFIERS (Feed Water)
Davis Engineering Co.,
90 West St., New York City.
Griscom-Russell Co.,
285 Madison Ave., New York City.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

HEATING EQUIPMENT
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

HEATING STOVES
Stamford Foundry Co.,
Stamford, Conn.

HOISTING ENGINES
Hyde Windlass Co., Bath, Me.

HOISTS (Air)
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland.
Ingersoll-Rand Co.,
11 Broadway, New York City

INDICATORS (Direction & Revolution)
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

INDICATORS (Helm Angle)
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

INDICATORS (Speed)
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

ICE MACHINES—See REFRIGERATING MACHINERY

INSURANCE (Marine)
Boland & Cornelius,
Marine Trust Bldg., Buffalo, N. Y.

IRON (Bar)
Wrought Iron Co. of America,
Lebanon, Pa.

IRON (Engine Bolt)
Wrought Iron Co. of America,
Lebanon, Pa.

IRON (Staybolt)
Wrought Iron Co. of America,
Lebanon, Pa.

LAMPS (Mazda and Arc)
General Electric Co.,
Schenectady, N. Y.

LIFEBOATS
Lane, C. M., Lifeboat Co., Inc.,
856 Humboldt St., Brooklyn, N. Y.
Welin Davit & Boat Corp.,
3-5 Vernon Ave.,
Long Island City, N. Y.

LIFESAVING EQUIPMENT
Lane, C. M., Lifeboat Co., Inc.,
856 Humboldt St., Brooklyn, N. Y.

LIGHTING EQUIPMENT
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

LUBRICATING OIL
Standard Oil Co., of New Jersey,
26 Broadway, New York City.
Vacuum Oil Co.,
61 Broadway, New York City.

MACHINERY (Marine)
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland, O.
Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.
Cooper-Bessemer Corp., The,
Grove City, Pa.
Great Lakes Engineering Works,
River Rouge, Mich.
Los Angeles Shipbuilding & Dry Dock Corp., San Pedro, Cal.
Manitowoc Ship Building Corp.,
Manitowoc, Wis.
Maryland Dry Dock Co.,
Baltimore Md.
Toledo Shipbuilding Co., Toledo, O.

MACHINES (Sounding)
Submarine Signal Co.,
160 State St., Boston, Mass.

MACHINISTS
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland, O.
Busch-Sulzer Bros.-Diesel Engine Co., 2nd & Utah Sts.,
St. Louis, Mo.
New York Shipbuilding Co.,
Camden, N. J.

MAGNETS (Lifting)
Cutler-Hammer, Inc.,
1265 St. Paul Avenue,
Milwaukee, Wis.

MANILA OAKUM—See OAKUM (Marine, Rope, Packings, Plumbers)

MARINE RAILWAY BUILDERS
Crandall Engineering Co.,
Cambridge, Mass.

MATERIAL HANDLING EQUIPMENT
Smith, Leathem D., Dock Co.,
Sturgeon Bay, Wis.

MATTRESSES
Simmons Co., The, 666 Lake Shore Drive, Chicago, Ill.

METERS (Gas & Air)
Cutler-Hammer, Inc.,
1265 St. Paul Avenue,
Milwaukee, Wis.

MOTOR GENERATOR SETS
Engberg Division of Troy Engine & Machine Co., 2229 Vine St.,
St. Joseph, Mich.
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.
General Electric Co.,
Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

MOTORS (Electric)
Engberg Division of Troy Engine & Machine Co., 2229 Vine St.,
St. Joseph, Mich.
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.
General Electric Co.,
Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.,
East Pittsburgh, Pa.

NAUTICAL INSTRUMENTS
Ritchie, E. S., & Sons,
Brookline, Mass.
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

NAVIGATING INSTRUMENTS
White, Kelvin & Wilfrid O., Co.,
112 State St., Boston, Mass.

NITROGEN
Linde Air Products Co.,
30 East 42nd St., New York City

OAKUM (Marine, Rope, Packings, Plumbers)
Stratford, George, Oakum Co.,
165 Cornelison Ave.,
Jersey City, N. J.

OIL BURNING EQUIPMENT
Babcock & Wilcox Co.,
85 Liberty St., New York City.
Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.

OIL FOR ALL PURPOSES (Marine)
Vacuum Oil Co., 61 Broadway,
New York City.

OXY-ACETYLENE APPARATUS
Oxweld Acetylene Co., The,
30 E. 42nd St., New York City

OXYGEN
Linde Air Products Co.,
30 East 42nd St., New York City.

PAINT BURNERS (Acetylene)
Prestolite Co., The, Inc.,
Auto Gas Div., 30 E. 42nd St.,
New York City

PASSENGER SERVICE
Hamburg-American Line,
39 Broadway, New York City.

PISTON RODS
Heppenstall Co.,
46th & A.V.R.R., Pittsburgh, Pa.

PLATES (Sheared Steel)
Alan Wood Steel Co.,
Conshohocken, Pa.

PLATES (Steel Floor)
Alan Wood Steel Co.,
Conshohocken, Pa.

PLATFORMS (Skid)
Truscon Steel Co., Pressed Steel Div., Youngstown, Ohio.

PORTABLE LIGHTS (Acetylene)
Prestolite Co., The, Inc.,
Auto Gas Div., 30 E. 42nd St.,
New York City

PROPELLER BLADES AND HUBS
Sheriffs Mfg. Co., Milwaukee, Wis.

PROPELLER WHEELS
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland, O.
Great Lakes Engineering Works,
River Rouge, Mich.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway,
New York City.
Sheriffs Mfg. Co., Milwaukee, Wis.
Toledo Shipbuilding Co., Toledo, O.
Trout, H. G. Co., 220 Ohio St.,
Buffalo, N. Y.

PROPELLERS
Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.
Hyde Windlass Co., Bath, Me.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway,
New York City.

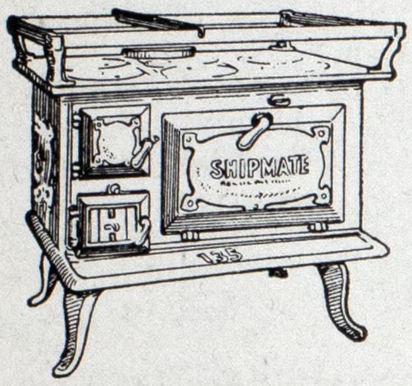
PULVERIZED COAL BURNERS
Todd Shipyards Corp.,
25 Broadway, New York City.

PUMPS
Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.
Dean Brothers Co.,
323 W. 10th St., Indianapolis, Ind.
Fairbanks, Morse & Co.,
900 S. Wabash Ave., Chicago, Ill.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

THREE SQUARE MEALS
–rain or shine

with a SHIPMATE



Unfortunately, owing to fog or to snow, the men in the dories don't always get back to the schooner; but always when they do, if there is a SHIPMATE in her galley square meals are ready for them no matter how hungry they are.

THE STAMFORD FOUNDRY CO.
STAMFORD, CONN.

DEAN BROS.
MARINE PUMPS

"The Dean of Pumps on Land and Sea"

Single Style & Duplex
Piston Type & Plunger

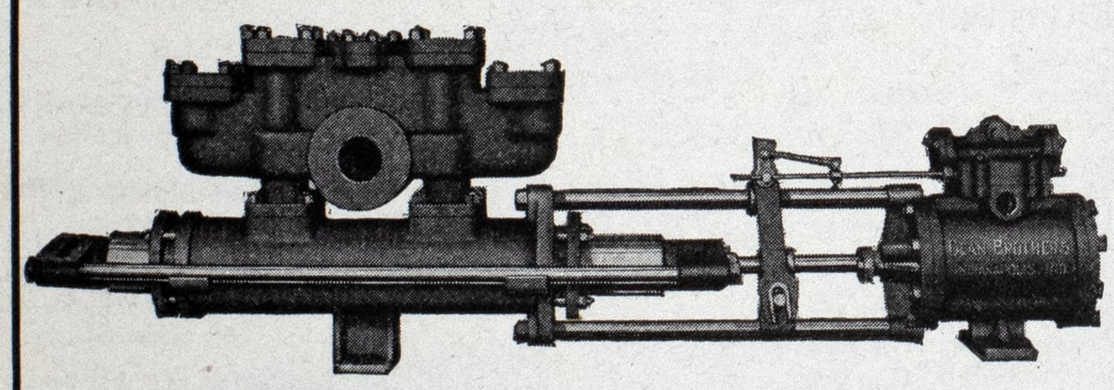


Figure No. 2311 Horizontal Single Style Double Acting Outside End Packed Plunger Trombone Pot Valve Pump For Boiler Feed & Pressure Service.

ESTABLISHED 1869

DEAN BROS. COMPANY

MANUFACTURERS OF PUMPING MACHINERY FOR ALL PURPOSES

323 WEST TENTH ST.

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THE strength of FIBORE — the original Fibre-Core Rope — can be obtained only in this particular type of cordage. Its *single* core in each strand, working as a unit, with all fibres sharing strains equally, is decidedly stronger than the usual group of center yarns, large or small.

The flexibility of FIBORE is the result of all the fibres in each core sliding along one another. There is no cross rubbing or binding, because of the absence of twisted elements. Each core consists of only one big bundle of smooth parallel fibres, protected by layers of cover yarns.

FIBORE'S endurance is a matter of *record* and not merely of advertising.

The underlying principle of the FIBORE type of construction is covered by broad basic patents in the United States and foreign countries.

Our patented WATERFLEX lubrication makes FIBORE truly the *last word* in large rope construction.

NEW PROCESS · NO CENTER YARNS TO BREAK
WHITLOCK
PAT'D JAN. 16 1923
FIBORE
(FIBRE CORE)
TRADE MARK
MANILA
GREATER STRENGTH · LONGER LIFE · EASIER TO HANDLE

WHITLOCK CORDAGE COMPANY

46 South Street
New York

Factory and Warehouses
Jersey City, N. J.

Branches
Chicago, Boston, Kansas City *and* Houston

PUMPS—Continued
Great Lakes Engineering Works, River Rouge, Mich.
Ingersoll-Rand Co., 11 Broadway, New York City.

PUMPS (Ballast)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.

PUMPS (Bilge)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.
Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill.

PUMPS (Boiler Feed)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.
Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill.

PUMPS (Direct Acting)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.

PUMPS (Power)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.
Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill.

PUMPS (Steam)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.
Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill.

PUMPS (Vacuum)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.

PURIFICATION SYSTEMS—See WATER PURIFICATION SYSTEMS

RADIO COMPASS AND DIRECTION FINDER

Radiomarine Corp. of America, 66 Broad St., New York City.

RADIO EQUIPMENT
Radiomarine Corp. of America, 66 Broad St., New York City.

RAFTS
Lane, C. M., Lifeboat Co., Inc., 856 Humboldt St., Brooklyn, N. Y.

RAILWAY DRY DOCKS
Crandall Engineering Co., Cambridge, Mass.

RANGES
Stamford Foundry Co., Stamford, Conn.

REFRIGERATING MACHINERY
Brunswick-Kroeschell Co., New Brunswick, N. J.
Ingersoll-Rand Co., 11 Broadway, New York City

REPAIRS
Los Angeles Shipbuilding & Dry Dock Corp., San Pedro, Cal.
Maryland Dry Dock Co., Baltimore, Md.

REPAIRS (Electric)
Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

REPAIRS (Marine)
American Shipbuilding Co., Foot of W. 54th St., Cleveland.
Bath Iron Works Corp., Bath, Me.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Canada Steamship Lines, P. O. 2435, Montreal, Can.
Chicago Shipbuilding Co., So. Chicago, Ill.
Collingwood Shipyards, Inc., Collingwood, Ont., Canada.
Great Lakes Engineering Works, River Rouge, Mich.
Manitowoc Ship Building Corp., Manitowoc, Wis.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
New York Shipbuilding Co., Camden, N. J.
Sun Shipbuilding & Dry Dock Co., Chester, Pa.
Todd Shipyards Corp., 25 Broadway, New York City.
Toledo Shipbuilding Co., Toledo, O.
United Dry Docks, Inc., 11 Broadway, New York City

REPAIRS (Marine Engine)
Collingwood Shipyards, Inc., Collingwood, Ont., Canada.
Electric Boat Co.-New London Ship & Engine Works, 247 Park Ave., New York City.

REPAIRS (Turbine)
Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

REVOLUTION COUNTERS
Cummings Machine Works, 255 Atlantic Ave., Boston, Mass.
Sperry Gyroscope Co., Manhattan Bridge Plaza, Brooklyn, N. Y.

RIVETS
Wrought Iron Co. of America, Lebanon, Pa.

RINGS (Steel)
Heppenstall Co., 46th & A.V.R.R., Pittsburgh, Pa.

ROLLS (Steel)
Heppenstall Co., 46th & A.V.R.R., Pittsburgh, Pa.

ROPE (Manila, Net, Sisal, and Other Hard Fiber Cordage)
Columbian Rope Co., Auburn, N. Y.
Samson Cordage Works, Boston.
Whitlock Cordage Co., 46 South St., New York City.

ROPE (Transmission)
Columbian Rope Co., Auburn, N. Y.

ROPE OAKUM
Stratford, George, Oakum Co., Jersey City, N. J.

RUBBER TILE
Selby, Battersby & Co., 33rd & Arch Sts., Philadelphia.

RUST PREVENTATIVE (Oil)
Vacuum Oil Co., 61 Broadway, New York City.

SAFETY VALVES (Marine)
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.

SCHOONERS (Auxiliary)
American Shipbuilding Co., Foot of W. 54th St., Cleveland.
Toledo Shipbuilding Co., Toledo, O.

SEARCHLIGHTS (High Intensity)
Sperry Gyroscope Co., The, Brooklyn, N. Y.

SEARCHLIGHTS (Incandescent and Arc)
General Electric Co., Schenectady, N. Y.
Sperry Gyroscope Co., The, Brooklyn, N. Y.

SELF UNLOADING EQUIPMENT
Smith, Leathem D., Dock Co., Sturgeon Bay, Wis.

SEPARATORS (Oil)
Babcock & Wilcox Co., 85 Liberty St., New York City.

SHEAR BLADES & KNIVES
Heppenstall Co., 46th & A.V.R.R., Pittsburgh, Pa.

SHEETS (Blue Annealed)
Alan Wood Steel Co., Conshohocken, Pa.

SHIPBUILDERS
American Shipbuilding Co., Foot of W. 54th St., Cleveland.
Bath Iron Works Corp., Bath, Me.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Canada Steamship Lines, P. O. Box 2430, Montreal, Can.
Collingwood Shipyards, Inc., Collingwood, Ont., Canada.
Great Lakes Engineering Works, River Rouge, Mich.
Los Angeles Shipbuilding & Dry Dock Corp., San Pedro, Cal.
Manitowoc Ship Building Corp., Manitowoc, Wis.
Maryland Dry Dock Co., Baltimore, Md.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
New York Shipbuilding Co., Camden, N. J.
Smith, Leathem D., Dock Co., Sturgeon Bay, Wis.
Sun Shipbuilding & Dry Dock Co., Chester, Pa.
Todd Shipyards Corp., 25 Broadway, New York City.
Toledo Shipbuilding Co., Toledo, O.
United Dry Docks, Inc., 11 Broadway, New York City.

SHIPBUILDING SYSTEMS
Isherwood, J. W., & Co., Ltd., 17 Battery Place, New York City.

SHIP STABILIZERS
Sperry Gyroscope Co., The, Brooklyn, N. Y.

SIGNALS (Submarine)
Submarine Signal Co., 160 State St., Boston, Mass.

SKID PLATFORMS (Lift Truck)
Truscon Steel Co., Pressed Steel Div., Youngstown, O.

SOLDERING IRONS (Acetylene)
Prestolite Co., The, Inc., Auto Gas Div., 30 E. 42nd St., New York City

SOUNDING MACHINES
Submarine Signal Co., 160 State St., Boston, Mass.

SPRINGS (Box, Bed)
Simmons Co., The, 666 Lake Shore Drive, Chicago, Ill.

SPUN OAKUM
Stratford, George, Oakum Co., Jersey City, N. J.

STEAMSHIP COMPANIES (Lake Passenger & Freight)
Cleveland & Buffalo Transit Co., The, E. 9th St., Pier, Cleveland, O.

STEAMSHIP LINES (Passenger and Freight)
Hamburg-American Lines, 39 Broadway, New York City.

STEAM GAGES
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.

STEAM TRAPS
Davis Engineering Co., 90 West St., New York City.

STEEL (Electric Induction)
Heppenstall Co., 46th & A.V.R.R., Pittsburgh, Pa.

STEEL BARGES—See BARGES (Steel)

STEEL TANKS
Brunswick-Kroeschell Co., New Brunswick, N. J.

STEERING ENGINES
Hyde Windlass Co., Bath, Me.

STEERING GEARS
American Shipbuilding Co., Foot of W. 54th St., Cleveland.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Hyde Windlass Co., Bath, Me.

STORAGE BATTERIES—See BATTERIES

STOVES
Stamford Foundry Co., Stamford, Conn.

SWITCHBOARDS
Engberg Division of Troy Engine & Machine Co., 2229 Vine St., St. Joseph, Mich.
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

TANKS (Acetylene Gas)
Prestolite Co., The, Inc., Auto Gas Div., 30 E. 42nd St., New York City

TELEMOTORS
Hyde Windlass Co., Bath, Me.

TORSION METERS
Cummings Machine Works, 255 Atlantic Ave., Boston, Mass.

TOWING
Moran Towing & Transportation Co. 17 Battery Place, New York City.

TOWING LINES
Columbian Rope Co., Auburn, N. Y.
Whitlock Cordage Co., 46 South St., New York City.

TRACTORS
Clark Tructractor Co., Battle Creek, Mich.
Elwell-Parker Electric Co., The, 4205 St. Clair Ave., Cleveland, O.

TRANSMISSION (Rope)—See ROPE (Transmission)

TREADS (Steel Stair & Ladder)
Alan Wood Steel Co., Conshohocken, Pa.

TRUCKS
Clark Tructractor Co., Battle Creek, Mich.
Elwell-Parker Electric Co., The, 4205 St. Clair Ave., Cleveland, O.

TURBINES (Electric)
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., So. Philadelphia, Pa.

TURBINES (Marine)
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
Westinghouse Electric & Mfg. Co., So. Philadelphia, Pa.

TURBINES (Steam)
DeLaval Steam Turbine Co., Trenton, N. J.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
Sturtevant, B. F., Co., Hyde Park, Boston, Mass.
Westinghouse Electric & Mfg. Co., So. Philadelphia, Pa.

TWINE AND ROPE
Columbian Rope Co., Auburn, N. Y.
Samson Cordage Works, Boston.
Whitlock Cordage Co., 46 South St., New York City.

VALVES AND FITTINGS
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.

VENTILATING EQUIPMENT
Sturtevant, B. F., Co., Hyde Park, Boston, Mass.

WATER PURIFICATION SYSTEMS
Griscom-Russell Co., 285 Madison Ave., New York City.

WELDERS (Electric Arc)
Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

WELDING & CUTTING APPARATUS (Oxy, Acetylene, Oxy-Gas)
Oxweld Acetylene Co., The, 30 E. 42nd St., New York City

WELDING GAS
Prestolite Co., The, Inc., 30 E. 42nd St., New York City

WELDING SUPPLIES
Oxweld Acetylene Co., The, 30 E. 42nd St., New York City

WHISTLES
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.

WINCHES
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Dake Engine Co., Grand Haven, Mich.
Hyde Windlass Co., Bath, Me.

WINDLASSES
American Shipbuilding Co., Foot of W. 54th St., Cleveland.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Dake Engine Co., Grand Haven, Mich.
Hyde Windlass Co., Bath, Me.

WIRELESS MESSAGE SERVICE
Radiomarine Corp. of America, 66 Broad St., New York City.

WIRELESS SETS AND APPARATUS
Radiomarine Corp. of America, 66 Broad St., New York City.

WORKBOATS
Lane, C. M., Lifeboat Co., Inc., 856 Humboldt St., Brooklyn.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

ANDREW J. MORSE & SON, Inc.
221 High Street BOSTON, MASS.
Established 1837

Diving Apparatus and Submarine Armor
Fire Department Supplies
The Morse Monitor Nozzle
Callahan Shut-Off Nozzle

THE MULHOLLAND HATCH-FASTENER COMPANY
Marion Building, Main 0272 **Cleveland, Ohio**

Manufacturers of the Mulholland Simplex and Security Hatch Fasteners.
For Ocean and Lake Trade

OVER 225,000 SETS NOW IN USE ON THE GREAT LAKES

Kelvin & Wilfrid O. White Co.
112 State Street, Boston
Ship Compasses
Navigational Equipment
Contracts a Specialty
New York and Montreal

Vessel
and
Insurance Agents

Edward P. Farley & Co.
Incorporated
Steamship Owners, Agents and Brokers
11 Broadway—New York

John J. Boland Adam E. Cornelius
BOLAND & CORNELIUS
VESSEL OWNERS AND BROKERS
Marine Insurance Agents
Marine Trust Building BUFFALO, N. Y.

Ship For Sale?

If you have a passenger ship, freighter, tanker, tug or any other floating property or marine equipment for sale advertise it in Marine Review.

The rate is $3.00 for a minimum advertisement of 30 words. Additional words, 10c each.

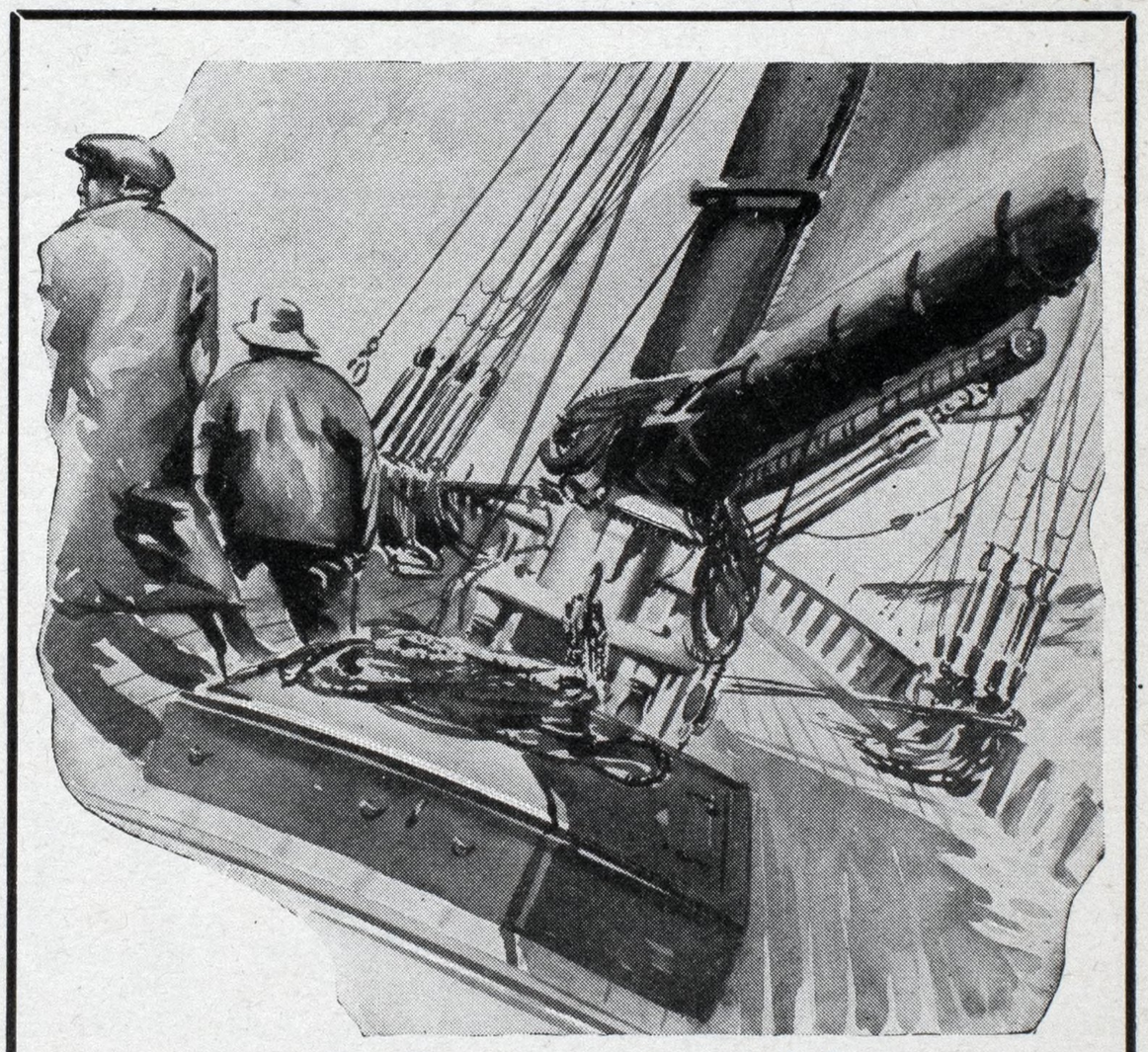
SAMSON SPOT
Log Lines

Smooth, tough and durable; no adulterating material to stiffen it and decrease strength and durability. Solid braided of extra quality cotton yarn. Uniform in size and quality. Easily identified by the colored spots, our trade mark.

We also manufacture flag halyards, lead lines, tiller rope; solid braided cotton cord in all sizes for various marine uses. Ask for catalog and samples.

Trade Mark Reg. U.S. Pat. Off.

SAMSON CORDAGE WORKS
89 BROAD STREET BOSTON, MASS.
TRADE MARK



"Then Ho for the sea so damp and free"

Deep sea sailormen realize that in a well-caulked tight bottom lies not only the welfare of the vessel and the crew but the safe delivery of the cargo.

For a hundred years,

STRATFORD OAKUM

has been keeping the ocean out of the finest ships that sail. Sailors depend on Stratford Oakum because they know it is the best.

Stratford Oakum is most economical to use. Wastage is very small, less labor is required to spin and caulk and it "stays put," whether in deck, side or bottom.

Seams right-caulked with Stratford Oakum will stay tight longer than when any other material is used.

Be sure you get Stratford Oakum
George Stratford Oakum Company
Jersey City, New Jersey
Also Manufacturers of Cotton Wiping Waste *5

Classified Advertisements

For Sale and Miscellaneous—Help and Positions Wanted

For Sale and Miscellaneous Advertisements
10c per word—minimum advertisement—$3.00

Six words must be added for box address.

To insure insertion, advertisements must reach us by the 10th of the month.

Help Wanted Advertisements
6c per word—minimum advertisement—$3.00

Position Wanted Advertisements
4c per word—minimum advertisement—$1.00

Please have remittance accompany order.

For Sale

FOR SALE OR CHARTER, 60 X 16 X 4 FT. 4 draft, Standard Engine 6 x 8, 6 cyl., Inspected and equipt to carry 125 people. Tows and handles well and is a first class boat, wheel house control, lavatory, running water, Delco Light plant, etc., and is ready to go right now. McLOUTH SHIPYARD, MARINE CITY, MICH.

FOR SALE: MARINE ENGINES AND boilers of all sizes; light draft wooden and steel tug boats for sale or charter; derrick boats, deck scows and lighters for sale or charter. Cowles Towing Co., Buffalo, N. Y.

For Sale

5000 TON STEAMER
For Sale
S. S. ROCKEFELLER
located Toledo, Ohio
Fine Condition
The Central Dredging Co.
Chicago

FOR SALE:—S. S. SPORT, AUTOMOBILE Ferry, Side Wheeler, Length 90'1", Beam 24 Ft., Capacity 8 cars. Apply to W. Bingley & Son, Ltd., Cornwall, Ont., Canada.

TUG MANOMET
For Sale or Charter
The Central Dredging Co.
Chicago

Proposals

Sealed proposals will be opened by Cooper River Ferry Liquidating Commission of Charleston, S. C., on May 15th, 1930, for the purchase of their operating ferry properties, either in whole or any part thereof, consisting of practically new, double-ended ferry boat "PALMETTO", built in year 1926, width 36 feet, length 136 feet, 360 horsepower direct reverse Fairbanks Morse full Diesel engine, capacity 36 automobiles, 600 passengers. Also ferry docks and slips at Charleston, Hog Island, and Mt. Pleasant. Also double-ended, iron-hull, ferryboat "LAWRENCE", 52 feet wide, 153 feet long.
Commission reserves the right to reject any and all bids. For further particulars address:
COOPER RIVER FERRY LIQUIDATING COMMISSION,
A. O. HALSEY, Chairman
Charleston, S. C.

Help Wanted

SALESMEN EARN BIG MONEY SELLING our new Waterproof grease to the Marine trade, superior quality of our product proven by quick demonstration. Hot or cold water does not affect it and it is 100% lubricant. Dandy side line. The Warren Refining & Chemical Co., Cleveland, Ohio.

TO OUR SUBSCRIBERS

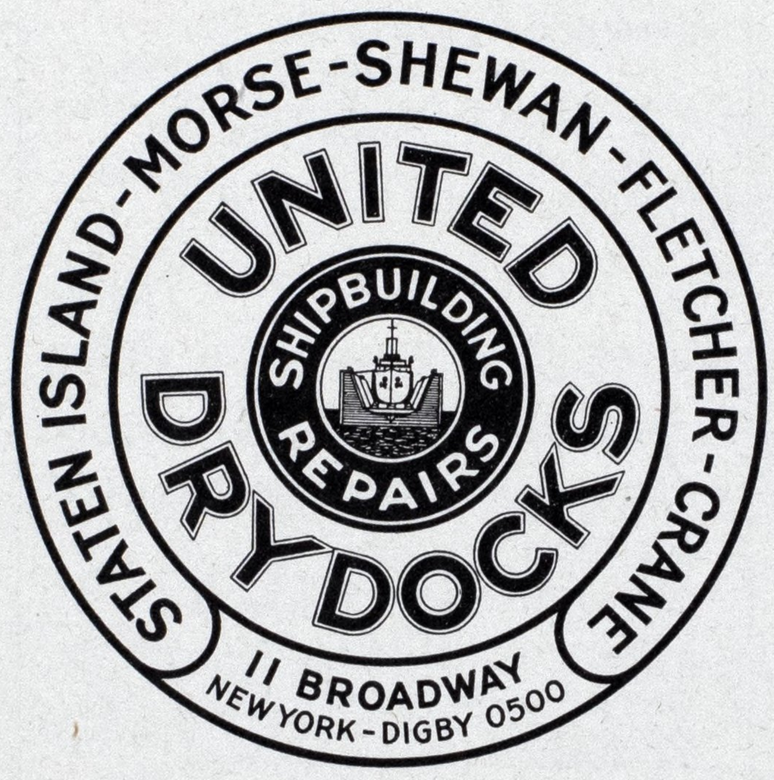
The classified section of MARINE REVIEW is for your convenience—its value is proving very worthwhile to everyone who uses it to buy and sell.

If you want to buy or sell ships or marine equipment—need a man for your organization—make it known to the entire marine industry through the use of classified advertising in MARINE REVIEW.

Mail copy for your advertisement in the June issue today, so it reaches us before May 20.

IF IT CAN BE DONE UNITED CAN DO IT

The Mark of Quality in Ship Repairs —



UNITED DRY DOCKS

Incorporated

11 Broadway DIGby 0500 New York

IF IT CAN BE DONE UNITED CAN DO IT

Index To Advertisers

Almy Water Tube Boiler Co. . . 78
American Ship Building Co. . . 6

Babcock & Wilcox Co. 80
Bath Iron Works Corp. 83
Bethlehem Shipbuilding Corp. Ltd. 14
Boland & Cornelius 87
Brunswick-Kroeschell Co. 80
Busch - Sulzer Bros. Diesel Engine Co. 3

Canada Steamship Lines 79
Carnegie Steel Company 79
Clark Tructractor Co. 61
Cleveland & Buffalo Transit Co., The 74
Columbian Rope Co. 15
Cooper-Bessemer Corp., The . . 73
Cummings Machine Wks. 77

Dake Engine Co. 79
Davis Engineering Corporation 74
Dean Brothers Co. 85
Dixon, Joseph, Crucible Co. . . 77

Electric Boat Co.-New London Ship & Engine Wks. 57
Electric Storage Battery Co. . . 65
Elwell-Parker Electric Co., The 63

Fairbanks-Morse Co. 75, 76
Farley, Edward P., & Co., Inc. 87
Federal Shipbuilding & Dry Dock Co. 8

General Electric Co. 67
Great Lakes Engineering Wks. 18
Griscom-Russell Co., The 78

Hamburg-American Line. 74
Heppenstall Company 9
Hyde Windlass Co. . . . . Back Cover

Isherwood, Sir Joseph W., & Co., Ltd. 72

Kelvin & Wilfrid O. White Co. 87

Lane, C. M., Lifeboat Co., Inc. 72
Linde Air Products Co. . . . . Inside Front Cover
Los Angeles Shipbuilding & Dry Dock Corp. 83

Manitowoc Shipbuilding Corp. 10
Marble & Shattuck Chair Co. 81
Maryland Dry Dock Co. 83
Moran Towing & Transportation Co., Inc. 59
Morse, Andrew J., & Son, Inc. 87
Mulholland Hatch - Fastener Co. 87

Newport News Shipbuilding & Dry Dock Co. Inside Back Cover
New York Shipbuilding Co. . . 71

Oldman-Magee Boiler Works, Inc. 80
Oxweld Acetylene Co. . . . . Inside Front Cover

Prest-O-Lite Co., Inc. . . . . Inside Front Cover

Radiomarine Corp. of America 11
Ritchie, E. S., & Sons 78

Samson Cordage Works 87
Selby, Battersby & Co. 80
Sheriffs Manufacturing Co. . . . 80
Simmons Co., The 13
Smith, Leathem D., Dock Co. 83
Sperry Gyroscope Co. 91
Stamford Foundry Co. 85
Standard Motor Construction Co. 70
Standard Oil Co. of New Jersey 77
Star Brass Mfg. Co. 72
Stratford, George, Oakum Co. 87
Sturtevant, B. F. Co. . Back Cover
Submarine Signal Co. 81
Sun Shipbuilding & Dry Dock Co. 12

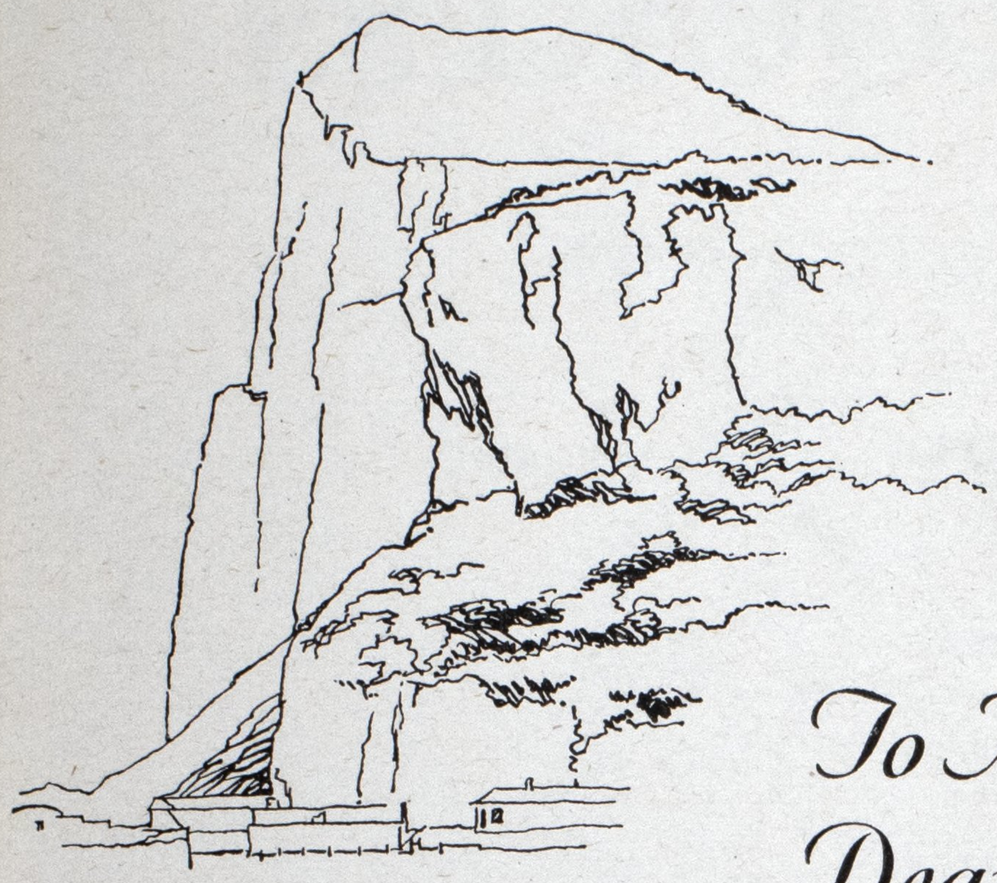
Toledo Shipbuilding Co., Inc. 16
Trout, H. G., Co. 80
Troy Engine & Machine Co. (Engberg Division) 78
Truscon Steel Co. (Pressed Steel Div.) 81

Union Carbide and Carbon Corp. . . . . Inside Front Cover
United Dry Docks, Inc. . . . . Front Cover, 89
United States Lines Operations, Inc. 17
United States Shipping Board Merchant Fleet Corporation 74

Vacuum Oil Co. 4

Welin Davit & Boat Corp. . . . 72
Westinghouse Elec. & Mfg. Co. 92
White, Kelvin & Wilfrid O., Co. 87
Whitlock Cordage Co. 85
Wrought Iron Co. of America. 7

4378 MILES IN ONE TRICK



Gibraltar,
March 15, 1930

To My Employer,
Dear Sir:

As you know, we have put in here for fuel and food supplies before proceeding to Marseilles.

Our voyage from Buenos Aires has been an exceedingly rough one, but even at that, they permitted me to steer without relief, from the time of our departure, until our arrival here. The Captain is well pleased with my ability to steer an accurate course. He has frequently commented on the accuracy of our position by "dead reckoning" as compared to our daily position by observation. The Chief Engineer has reported that the steering engine is run much less, as I am always dealing with the small beginning of each yaw.

After all, it is logical that I should do this tiresome, if not hypnotic, job of steering as it is only necessary to apply the correct amount of rudder at the right time.

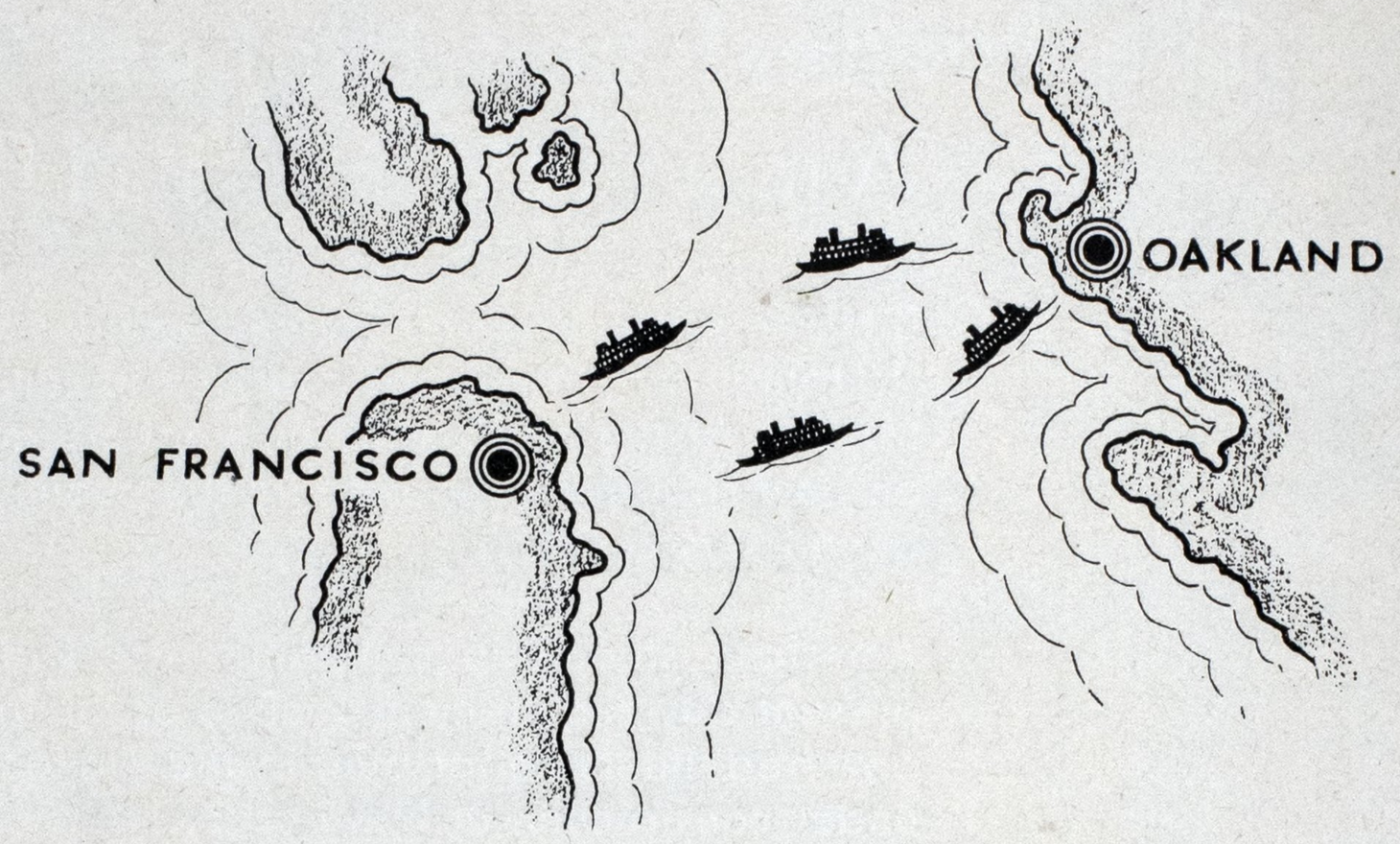
Address

SPERRY GYROSCOPE CO., Inc.
Manhattan Bridge Plaza
Brooklyn, New York

Sperry Gyro Pilot

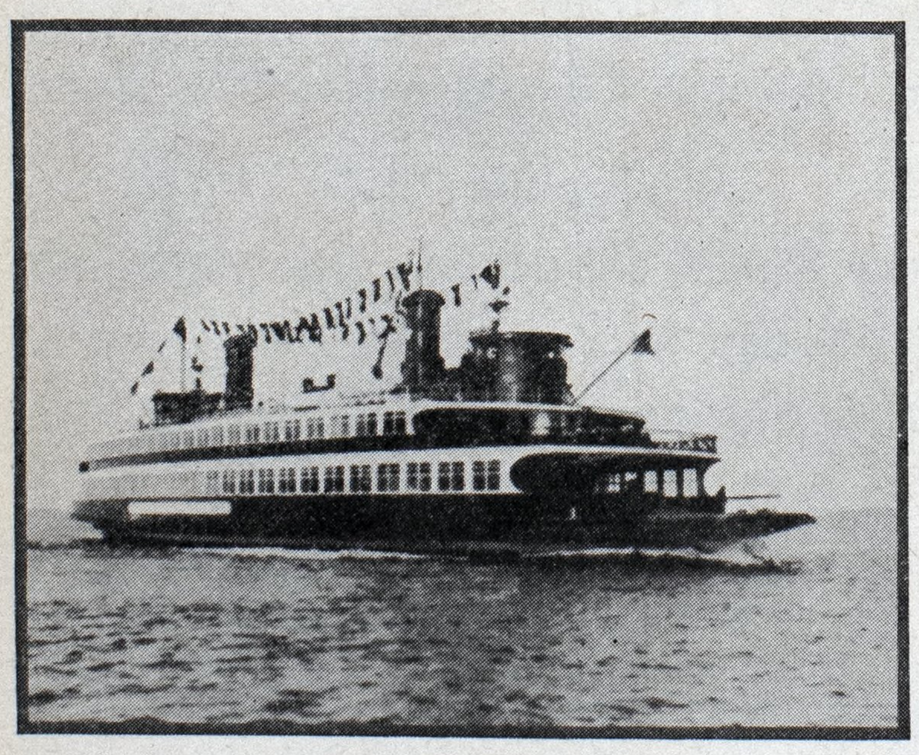
4378 MILES IN ONE TRICK

Shuttles *of* PROGRESS



. . . in San Francisco Bay

EIGHT electric drive ferries eqipped by Westinghouse are now in operation on San Francisco Bay.



BACK and forth they go—the ferries that plow San Francisco Bay, carrying the thousands who daily hurry to keep pace with business.

It is but natural that these ferries, so aptly called Shuttles of Progress, should be powered with the most modern and efficient type of marine propulsion.

By its faithful and economical performance, Westinghouse Diesel electric drive has provided convincing proof of its value in this class of vessel.

As a result, Westinghouse has equipped eight of San Francisco's electric ferries—a graphic commentary on the worth and efficiency of Westinghouse equipment.

Service, prompt and efficient, by a coast-to-coast chain of well-equipped shops

Westinghouse

WESTINGHOUSE ELECTRIC

T 31129

Under Construction at—

Newport News

The Largest and Highest Powered American—Built Liners

THE insistent demand for increased speed in transportation is by no means confined to rail, highway and air travel. All the leading maritime nations are busily engaged on new ship designs to gratify the public's desire for faster ocean service.

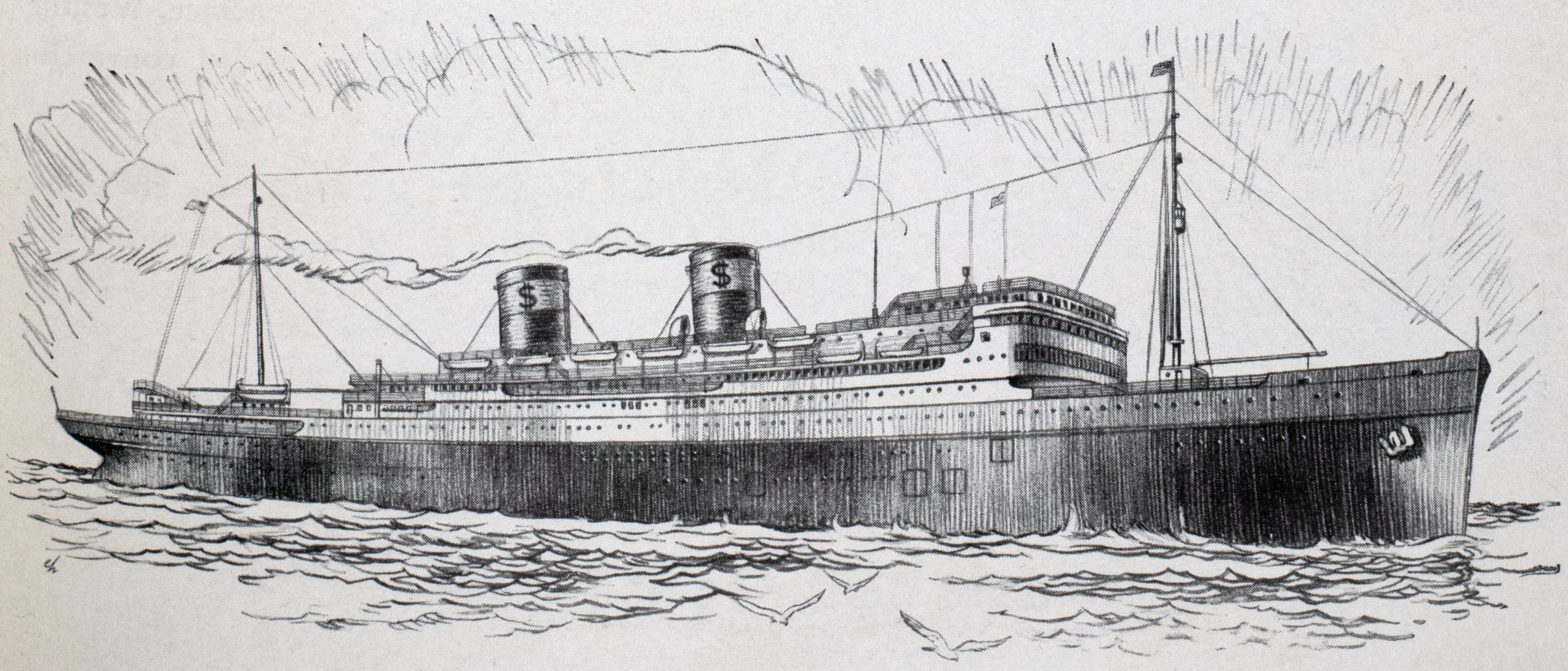
American steamship companies are wide awake to the present day requirements. Two of the largest and highest powered liners so far built in the United States are now under construction at Newport News.

In placing this contract the Dollar Steamship Lines, Ltd., Inc. gave careful consideration to the yard facilities—scientific organization and the character of the ships built at Newport News as well as the excellent design of the vessels proposed for their requirements.

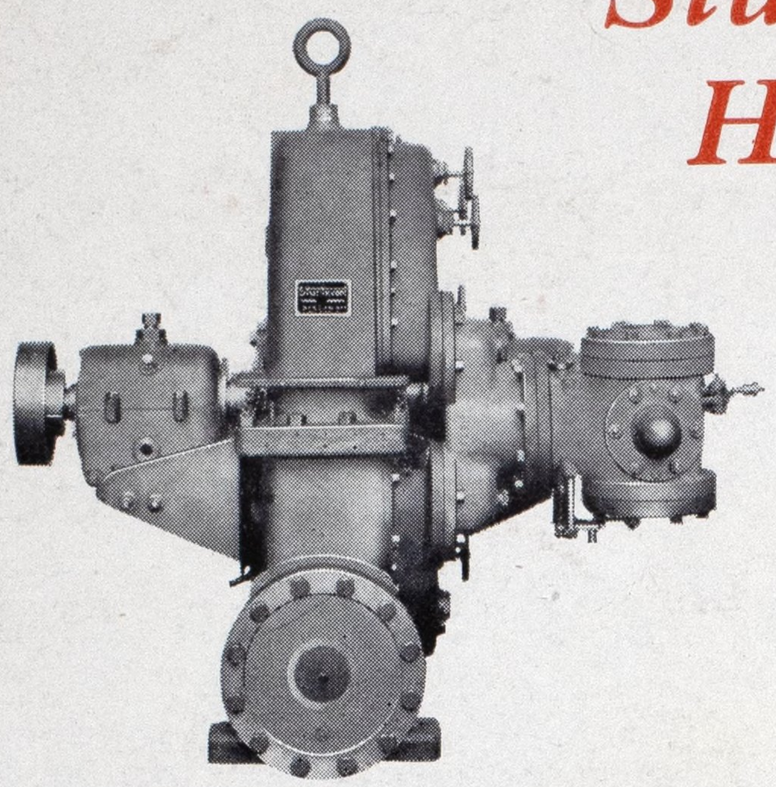
"SHIPS OF CHARACTER"

Newport News Shipbuilding and Dry Dock Company

Newport News, Va. 233 Broadway, New York City



Sturtevant Turbines Have Many Auxiliary Uses



Specializing in auxiliary service, Sturtevant Turbines provide a driving unit that is especially adapted to Marine work. They are used extensively for driving fire and flushing pumps, forced and induced draft fans, and generators.

The nozzles can be individually controlled—automatically or by hand—providing accurate adjustment for various loads and speeds. The wide speed and load range is a decided advantage.

All this means efficiency . . . economy . . . satisfaction—three outstanding characteristics of Sturtevant engineering. Have our Marine Department give you the details on Sturtevant Turbines.

B. F. STURTEVANT COMPANY, HYDE PARK, BOSTON, MASS.

Sales Engineering Offices in Principal Cities

Sturtevant REG. U. S. PAT. OFF.

Marine Equipment

Heating and Ventilating Equipment—
Mechanical Draft Equipment—Turbines—Motors—Blowers—
Ventilating Sets—Heaters—Generating Sets—Exhausters
Gasoline and Steam Engines

If You Want The Best Specify

Hyde

S. S. "A. F. HARVEY" owned by Pittsburgh Steamship Co. and built by Great Lakes Engineering Works.

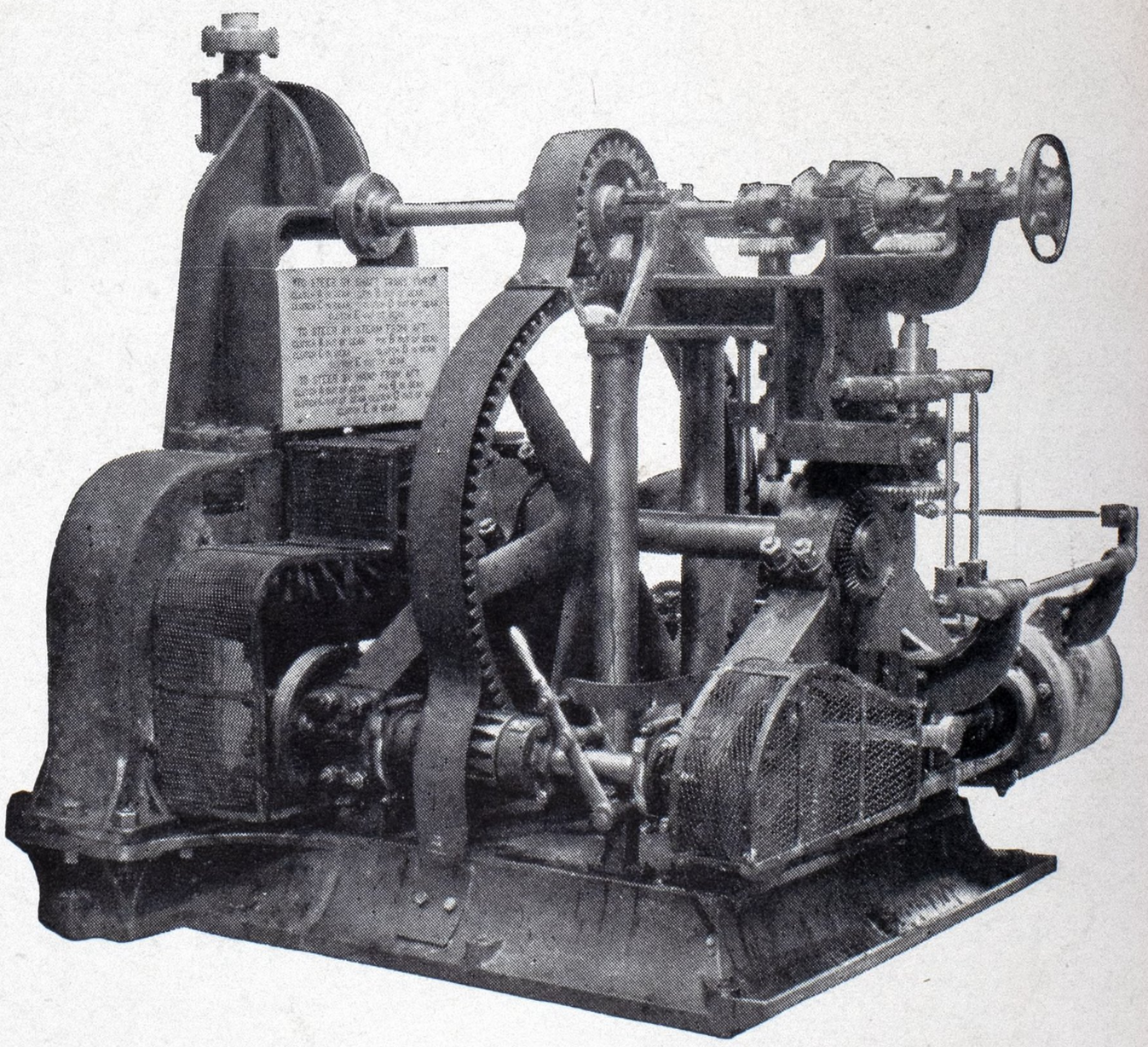
S. S. "B. F. AFFLECK" owned by Pittsburgh Steamship Co. and built by Toledo Shipbuilding Co.

S. S. "S. T. Crapo" owned by Huron Transportation Co. and built by Great Lakes Engineering Works.

These three fine new boats are all equipped with

Hyde

Quadrant Type Steering Gear
Spur Gear Windlass
Mooring Winches
Hatch Winches



HYDE Quadrant Type Steering Gear

Hyde Windlass Company

Bath, Maine